

SEP 18 1941

Engineering
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MOTOR AGE

FOR AUTOMOTIVE SERVICEMEN

A CHILTON PUBLICATION

SEPTEMBER 1941

THIS ISSUE

•
Moving Ground
Bearings
Bill Toboldt

•
Servicing Ford Six
Distributor

•
Ready for
the Service Boom
J. Edward Ford

•
Front End Service

•
Test the Thermostat
Bob Hankinson

•
and Hundreds of Other
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MOTOR AGE

With Which is Combined AUTOMOBILE TRADE JOURNAL
FOR AUTOMOTIVE SERVICEMEN

Vol. LX, No. 10

September, 1941

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SHOP TALK

By

Bill Tobolet

Look Out

Keep on the look out for ways and means of simplifying your work. With the defense projects taking many mechanics from the repair shops, owners are becoming more and more dependent on equipment to get their jobs finished.

Ersatz

While there have been some substitutions as the result of government priorities, there is nothing ersatz about the 1942 automobiles which are now being announced. Cast iron and steel are used, in some instances, instead of aluminum for pistons. But there are many who will argue that such a change would be an improvement. Instead of zinc die castings for grilles, chrome-plated steel stampings are used. In the interiors more plastic is in evidence. The new cars are just as good-looking, just as reliable, and just as durable as former models.

Gas

A godawful mess seems to be the consensus of the automotive men when discussing the efforts of Harold Petroleum Coordinator Ickes to find ways and means of conserving gasoline along the Eastern seaboard. That there is any need for conserving or that there is any actual shortage is questionable, according to many authorities, and we hope the whole mess will be brought out into the open by the investigation demanded by Senator Maloney.

That an investigation is necessary is quite evident by a perusal of the contradictions emanating



MOTOR AGE

SEPTEMBER 1941

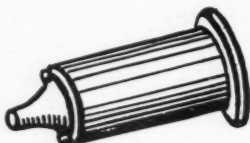
from Ickes' office—That the 7 o'clock curfew has reduced fuel consumption; that the 7 o'clock curfew has not reduced fuel consumption; that crude oil in stock on the East Coast is increasing; that only 10 days' supply of gasoline is on hand; that motorists need not have to forego vacation trips.

The situation would be laughable if it were not for the fact that the livelihood of many thousand mechanics depends on the sale of gasoline and the repair of automobiles.

The shortage of gasoline, if any, comes about through detailing tankers to carry fuel to England;

thus reducing the number available for carrying fuel to the Eastern markets. But some authorities state that only 32 tankers have been transferred to British service, and that, through the addition of new boats, raising of load line, re-scheduling runs, and acquisition of Axis tankers, we are actually five boats ahead of the game.

However, one thing seems to be certain and that is that the Administration is losing a large number of friends as the blame comes right back to the White House for appointing and retaining in office the incomparable Mr. Ickes.



HELP YOUR CUSTOMERS

THE threatened gasoline shortage on the Atlantic seaboard may be just a prelude to a general shortage that may spread all over the country when, as, and if our "short of war" effort turns into a "shooting" war.

If such conditions come to pass they are going to make quite a difference to the repairman. Car owners will demand unheard of performance from a gallon of gasoline, and the repairman who heretofore has been tuning up engines for normal performance will have to get down to brass tacks and tune the jobs to give economy with a capital "E". This will mean that the tune-up operations will have to be extended to include all factors that contribute even remotely to gasoline economy. Acceleration and high speed, in extreme cases, will have to be sacrificed.

There are many things that can be done to an engine to make it "give" for economy. Compression, for example, must be up to standard for all cylinders. There can be no lame cylinders if every ounce of power is to be obtained from each drop of gas. This may mean that, before some engines can be made to deliver the maximum economy, they will have to have new rings.

Valves and valve springs are very much in the picture. Poorly seating valves cause loss of power; springs that are too weak will permit the valve to bounce and thus waste gas. Excessive carbon accumulation causes spark knock and overheating, resulting in loss of power.

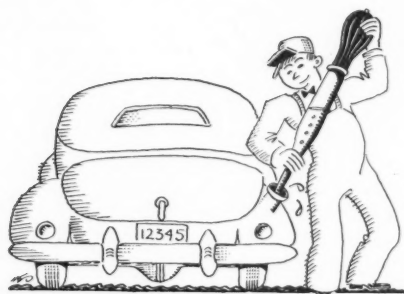
The cooling system must be clean so that the engine can operate at normal temperature. Local hot spots lead to cylinder distortion which results in increased friction,

power loss and higher fuel consumption.

Points that are pitted and burned and spark plugs whose electrodes are badly worn are also gasoline thieves. These will have to be cleaned and properly spaced, or replaced if necessary. Ignition timing, perhaps the biggest single factor in gasoline consumption, must be "right on the nose."

Proper ignition timing doesn't necessarily mean that it must be set to factory specifications. In some cases, particularly on the older model cars, the timing should be set at the point where maximum

SAVE GAS



With defense making inroads on our fuel supply, car owners demand greater mileage. Here is the way to meet the demand and boost your own business

economy is obtained for the particular grade of gasoline being used, so as to take advantage of the improved grade of gas we are getting today as compared with a few years ago. Cars that were made to give standard performance on 60 octane gas a few years ago will give better economy on 80 octane gas only if the ignition timing is set to take advantage of this increase in octane value.

While on the subject of gasoline, it is not beyond the realm of possibility that, should conditions become extreme, the three grades of gasoline we have today may be re-



duced to two or even one. In England today, all gasoline is "pooled"—one grade of gasoline for all cars and trucks.

Oil viscosity also has a bearing on economy and light oils are much to be favored from this angle.

The carburetor float level is a very important point in the control of gasoline consumption. A high float level leads to flooding, hard starting when hot, and a generally rich mixture throughout the entire speed range. Carburetor jets can be changed to leaner than standard for greater economy; metering rods also can be replaced by sizes one

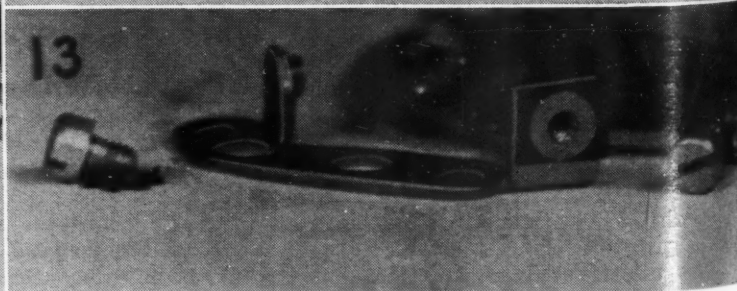
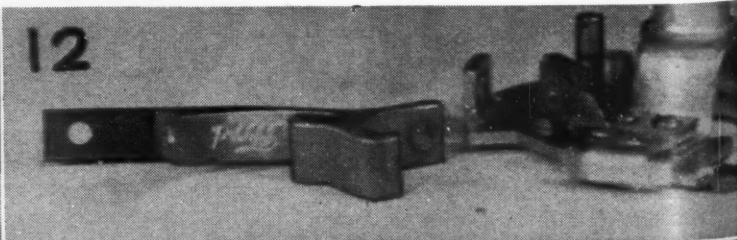
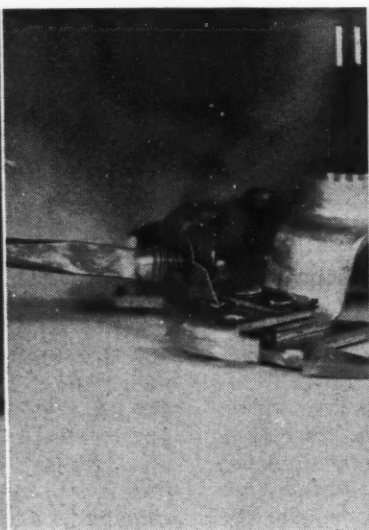
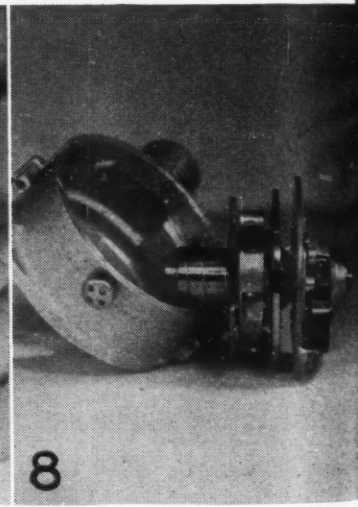
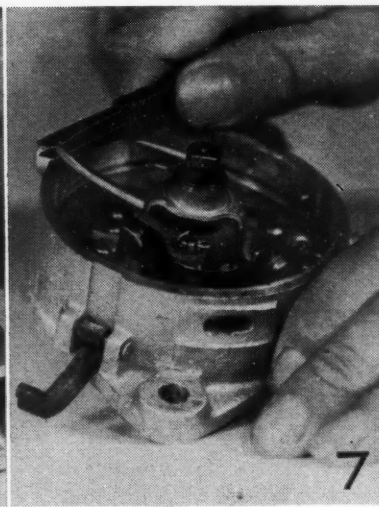
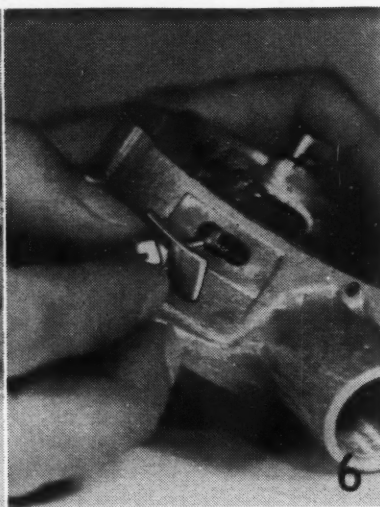
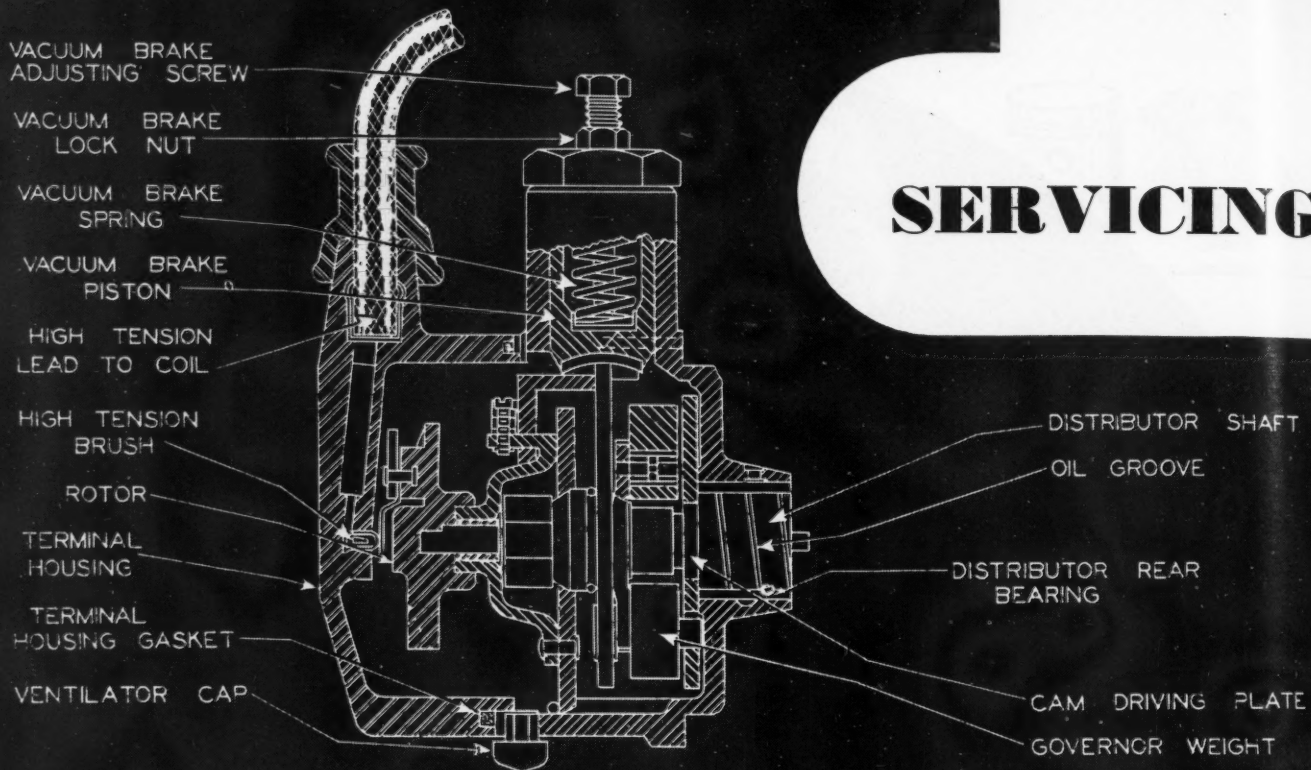
or two steps leaner. Idle adjusting screws that are slightly burred on the taper should be replaced with new ones so that a finer idle adjustment can be obtained. Disconnecting the accelerating pump will contribute to greater economy in a large degree.

Dragging brakes, under-inflated tires and misaligned wheels are other conditions that should be

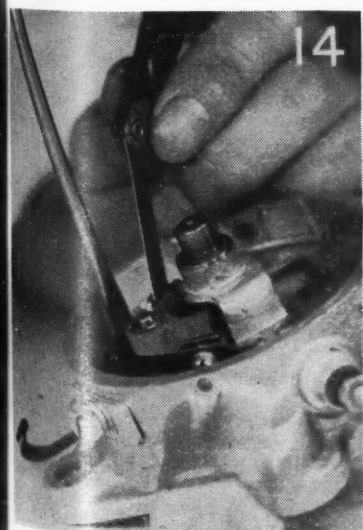
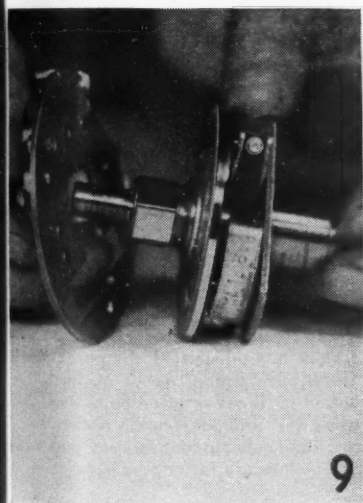
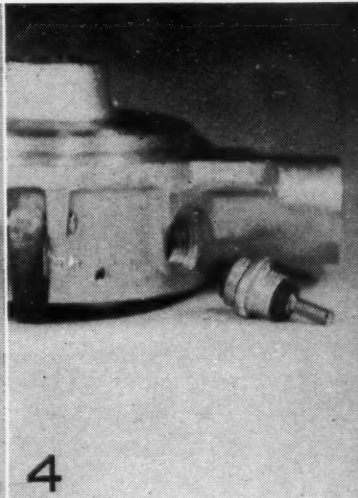
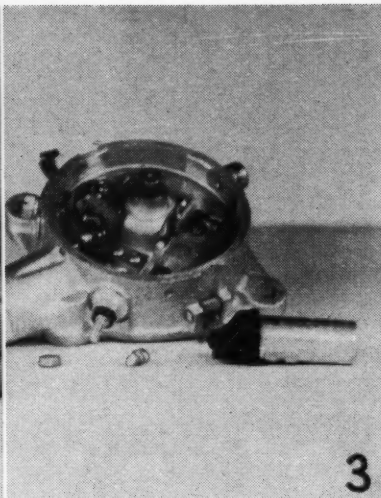
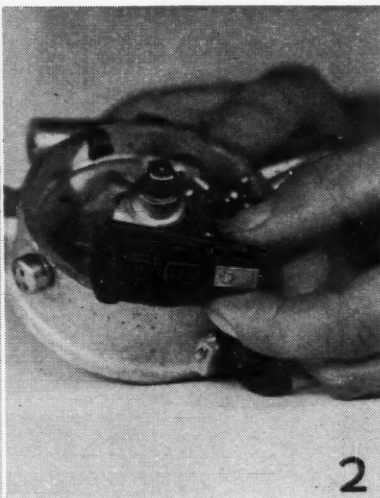
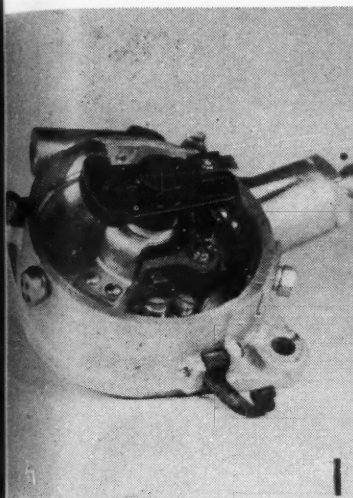
checked and corrected to promote gasoline economy. The manifold heat control valve must be free so it can operate properly; mufflers that are partially plugged, and bent or damaged muffler tail pipes set up a back pressure that has a serious effect on gasoline economy as well as performance.

After these points have been checked, the mechanic should instruct the driver in methods of operating his car to obtain maximum gasoline economy and place particular emphasis on the fact that high speeds and rapid acceleration consume more fuel.

SERVICING



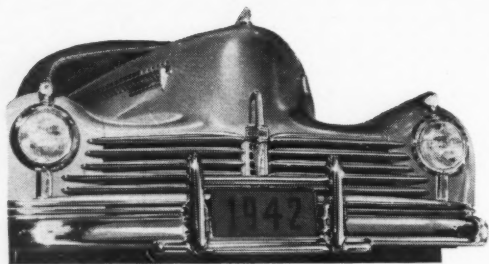
FORD-6 DISTRIBUTOR



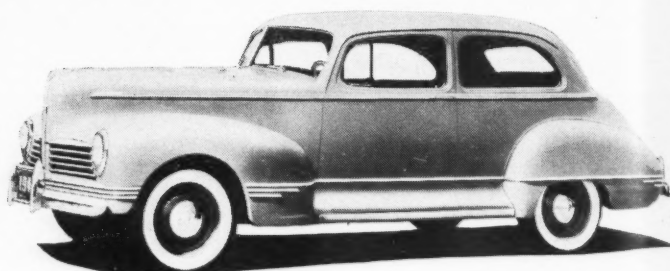
**Here is dope you will need in tuning up
this new passenger car and truck engine**

1. Ford six distributor.
2. Remove distributor rotor.
3. Remove condenser.
4. Remove condenser contact assembly from housing.
5. Remove vacuum brake assembly.
6. Remove distributor advance setting plate.
7. Remove distributor breaker plate retaining ring.
8. Remove breaker plate, governor weight and shaft assembly.
9. Slide breaker plate off shaft.
10. Remove cotter pin and washer from movable point.
11. Remove screw holding movable contact point spring and contact strip.
12. Lift movable contact from post.
13. Remove screw holding stationary point and remove point from plate.
14. After reassembly, set breaker points to .014 to .016 inches. Ignition timing is 2 degrees before top center. To adjust vacuum brake, back off the adjusting screw until the engine just pings under heavy load. Examine all parts for condition and replace or exchange unit as necessary.

FIRST OF THE 1942's



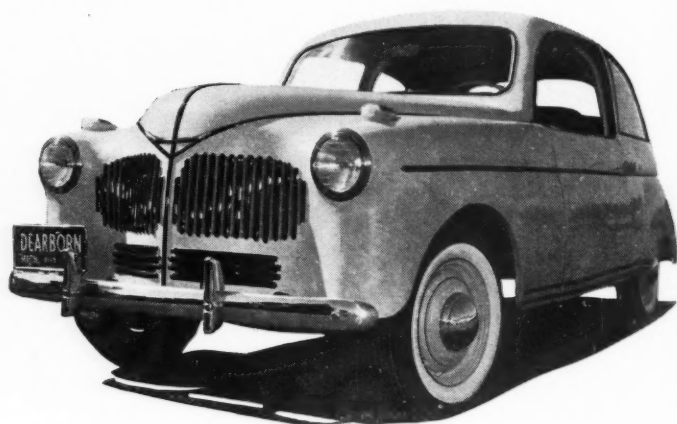
HUDSON. Three lines: Six De Luxe on 116-in. wheelbase, 6 cylinder 92-hp. engine; Super-Six on 121-in. wheelbase, 6 cylinder 102-hp. engine; Commodore on 121-in. wheelbase, with either 6 cylinder 102-hp. engine or 8 cylinder 128-hp. engine. The Commodore line also features Custom Eight Coupe on 121-in. wheelbase and Custom Eight Sedan on



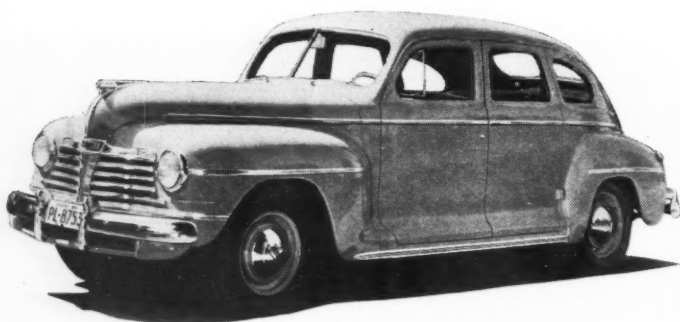
128-in. wheelbase. New front end and body styling—wider bodies—full-length, concealed running boards—Drive-Master (automatic transmission) optional on all models—improved economy—new instrument panel—greater riding comfort—new interior trim—new frame—improved springing and steering control for ease of handling.



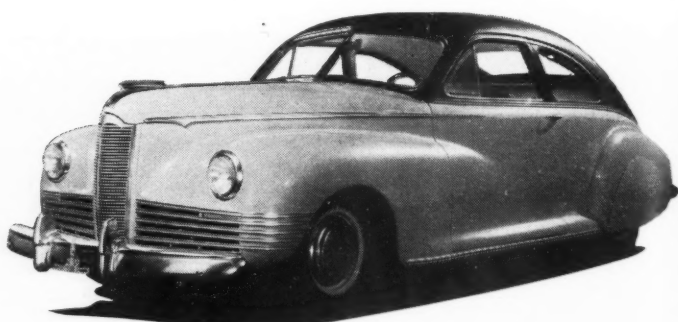
WILLYS AMERICAN. Sedan, coupe and de luxe station wagon. Commercial models include half-ton pick-up truck, panel delivery, and taxicab. Light weight, alloy iron pistons—new manifold heat control—improved gasoline economy—new front end styling—running boards standard, optional with no running boards—new instrument panel with increased use of plastic—two-tone upholstery—improved insulation against noise—new seat cushion spring construction—improved steering for ease of handling—new interior trim—improved riding qualities through use of improved rear springs and shock absorbers.



FORD. Not a 1942 model, but the first Ford car to be exhibited with a plastic body. The only steel in the superstructure of the body is the welded tubular frame to which the plastic panels are mounted. The complete car weighs about 2000 lb., while a steel unit of comparable size weighs approximately 3000 lb. The plastic panels are 1/4 in. thick, and are said to have an impact strength 10 times greater than steel. They are made of a mixture of synthetic resin with the fibrous material derived from such crops as wheat, flax, ramie, hemp and spruce pulp. It is still in the development stage, and not ready for production.



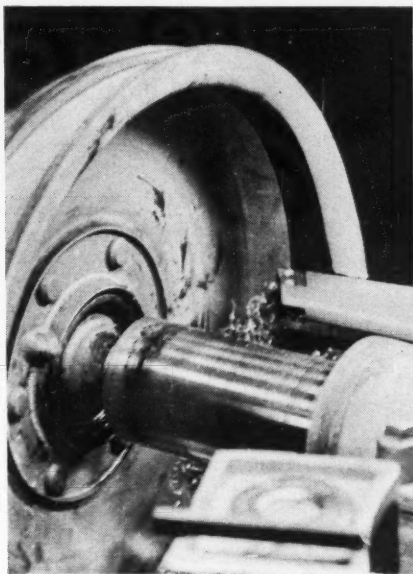
PLYMOUTH. De Luxe and Special De Luxe models—117-in. wheelbase—95-hp. engine—concealed running boards—new frame—body floor level with running board—new lightweight iron pistons—higher compression ratio, now 6.8 to 1—heavier crankshaft with special vibration damper—improved fuel economy—rear axle ratio 3.9—improved handling, front and rear stabilizer—dual air-tone horns connected with ignition switch—new instrument panel—new interior trim—improved riding qualities—parking lights in radiator grille—headlights mounted flush in fenders—new body styling—lower body mounting.



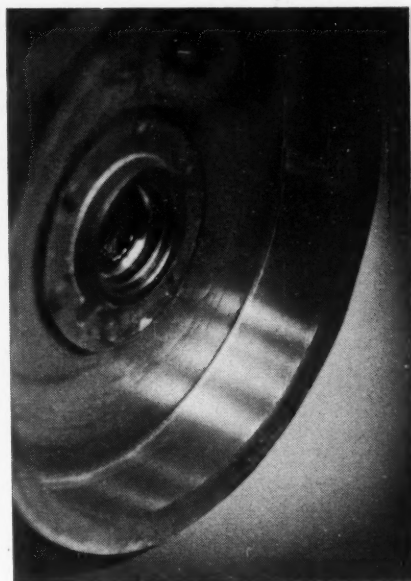
PACKARD. Three lines: Six, on 120-in. wheelbase, 105-hp. engine; Eight, 120-in. wheelbase, 125-hp. engine; Super Eight, 127-in. wheelbase, 165-hp. engine. Super Eight line has 6-passenger sedan on 138-in. wheelbase, and 7-passenger sedan and limousine on 148-in. wheelbase. Clipper body styling—increased engine horsepower—higher compression ratio—aluminum pistons with provision for changing to iron—electromatic drive optional—accelerator pedal starting switch—improved wheel suspension—turn signals standard—new frame—new rear spring mounting—improved riding comfort.



Scored drums, like the above, give poor brake performance and short lining life



Take light cuts with the lathe, removing just enough metal to take out the marks



Finish-grinding takes out all tool marks and leaves a smooth, mirror-like finish

Staff photographs through courtesy Quaker City Motor Parts Corp., Philadelphia, Pa.

RECONDITIONING BRAKE DRUMS

**Pointers on a job that parts scarcity
makes more important than ever before**

BRAKE drum turning has grown to be a very important part of a major brake overhauling operation. Scored drums not only contribute to short brake lining life, but result in erratic brake action and possible brake failure.

While there is some brake reconditioning work to be found in the passenger car field, the major part of this work is in the heavy-duty truck field. The heavier weight that must be brought to a stop requires larger and heavier drums and a more severe brake application which is obtained by equipping the majority of trucks with

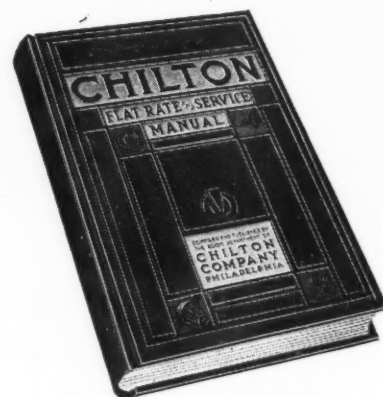
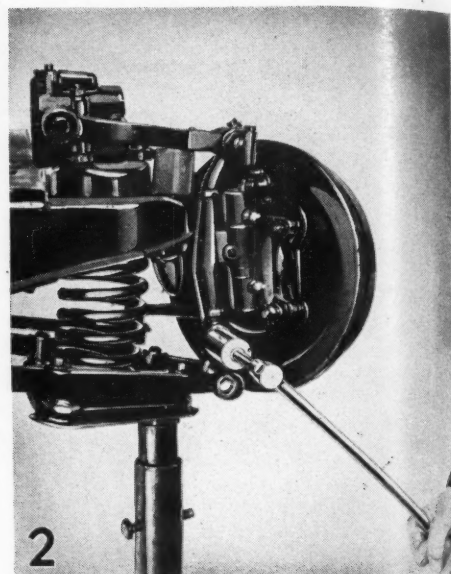
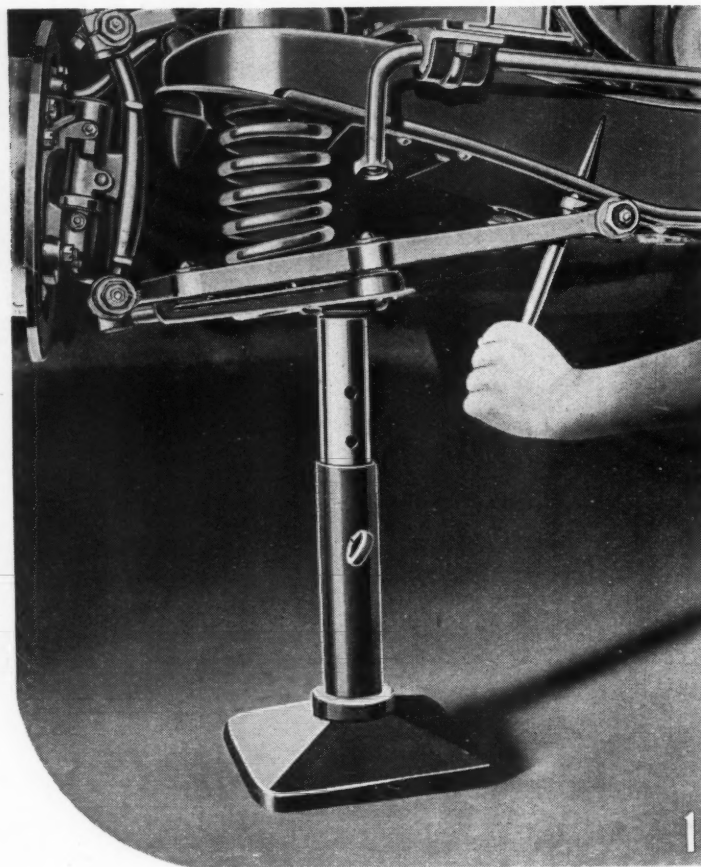
air-powered brakes. When dirt enters between the lining and the drum, or on incorrect type of brake lining or poor brake shoe adjustment is allowed to come into the picture, the result is a scored drum or a drum forced out-of-round. Truck brake drums run into real money, so it pays to have them reconditioned rather than replaced.

When setting up a drum-reconditioning job, there are two points that should be checked immediately, before the operation is actually started. First the rivets or bolts attaching the drum to the hub must be checked to be sure that

they are tight and hold the parts rigidly together. Next, the wheel bearing outer races must be checked to be sure that they are tight in the hub and do not turn. If they are loose in the hub, they will prevent the drum from running true when locked up in the reconditioning machine. New races should be tried to see if they will fit tightly. If they won't it will be necessary to install a new hub and new races.

Then the depth of the cut required to remove the score marks and to bring the drum to a true round condition should be checked to determine if, after this amount of material is removed from the drum, there will be enough of the drum left to insure satisfactory operation. Keeping in mind the amount of pressure exerted on the drum when the brake is applied, care must be taken to avoid turning a drum so much that it is too thin to withstand this pressure and would be forced out of round after a few emergency brake applications.

Some shops turn a drum with the regular drum-turning equipment, using a pointed cutter and removing just enough metal to smooth up the surface. Others follow this machining operation with a grinding operation to remove the tool marks. This results in a mirrorlike finish which provides a perfect contact surface for the lining.



The mechanical procedure in this and other articles in *Motor Age* supplements the Service Section of the Chilton Flat Rate and Service Manual, the book used by 26,000 maintenance shops.

FRONT END SERVICE

Correct procedure for replacing parts on the 1941

ONE of the outstanding features of the 1941 Chevrolet is that the front wheel suspension system can be removed from the frame side rails as a complete unit in the event that it is necessary to replace the frame. After disconnecting the light wires and the fender attaching bolts, both front fenders and the radiator can be lifted off. Then, by removing the front bumper and disconnecting the stabilizer from the frame horns, removing the Pitman arm, and removing the bolts attaching the front cross member to the frame side rails, the front end assembly can be

removed by simply sliding it off over the front of the side rails.

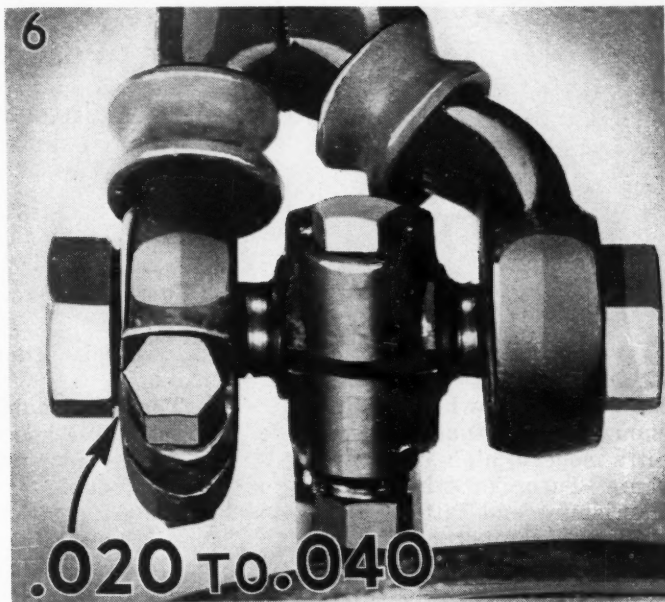
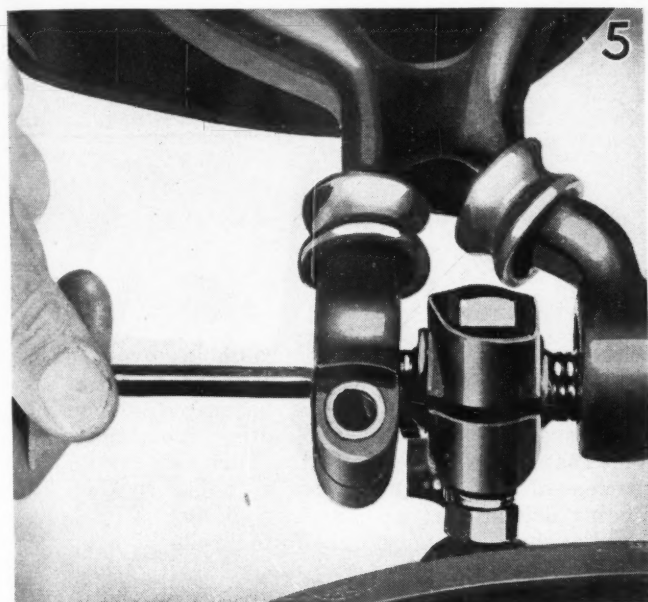
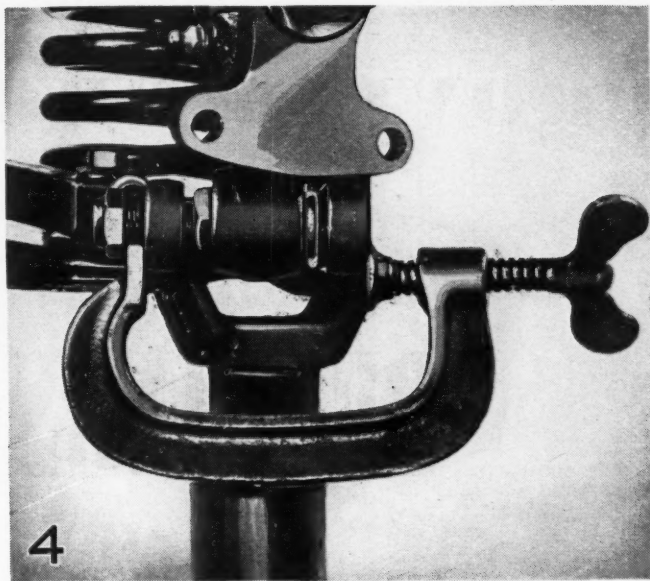
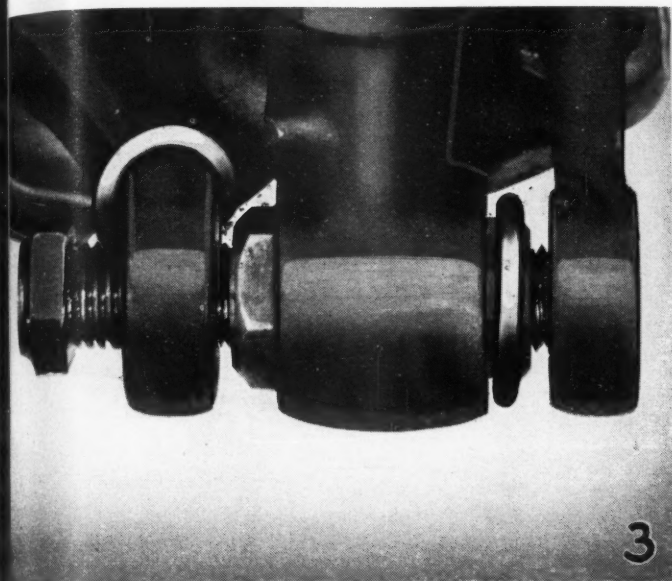
Repairs to the front suspension unit itself are made with the unit attached to the car in the normal manner. Following is the procedure for the more common operations:

Replace Front Spring

Disconnect the stabilizer link from the front spring seat. Raise the front end of the car with a chain hoist until the front wheel clears the floor. Place a jack under the inner side of the spring seat in the lower control arms, and lower the car until the weight is carried

on the jack. Remove the nuts and bolts holding the lower control arm shaft bracket to the front cross member unit, and insert a long drift punch in one of the holes to hold the unit in alignment, as shown in Fig. 1. Then raise the car slowly with the chain hoist to relieve the spring pressure, and remove the jack. The lower control arm will swing downward, allowing the spring to be removed.

When reinstalling the spring, be sure that the ground end of the spring is at the top, and that the bottom on the spring is properly fitted into the seat provided for it



Chevrolet front-wheel suspension unit

in the lower control arm spring pad. Swing the lower control arms up in place, using the long drift to maintain alinement. Place a jack under the arms and lower the car with the chain hoist. Install the bolts and nuts connecting the control arm shaft brackets to the frame cross member. Raise the car again to remove the jack, and lower it to the floor before connecting the stabilizer link to the spring pad.

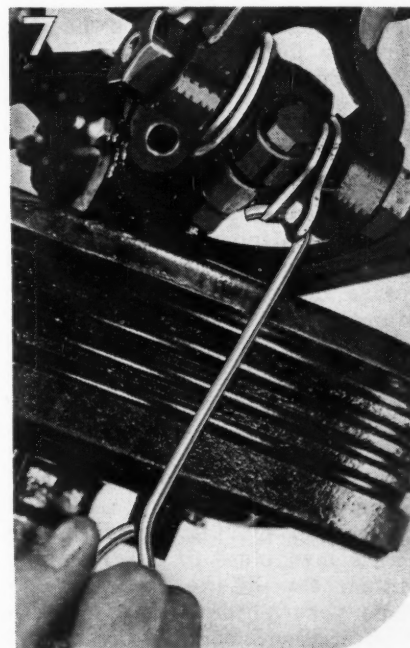
Replace Lower Arm Pin

Raise the car with a chain hoist and place a jack under the spring seat. Remove the tire and wheel

assembly. Remove the lower pivot pin from the control arms and the steering knuckle support arm. Turn the wheel to the extreme outward position so as to lock the knuckle support to prevent it from swinging outward at the bottom when removing the bushing. Then remove the bushing in the knuckle support arm, as shown in Fig. 2.

When installing new parts, install the bushing first, being sure that it is tightened securely in the knuckle support. Place a new rubber seal over the plain end of the bushing, and another over the front

(Continued on page 66)



PROVING GROUND FOR BEARINGS

Sustained high speeds on Pennsylvania's super highway bring new problems to service and design engineers



REPAIR business is increasing by leaps and bounds for the servicemen who are fortunate enough to be situated close to the ultra-modern, high-speed Pennsylvania Turnpike which connects Harrisburg and Pittsburgh, Pa.

"The cars just can't take it," seems to be the verdict of the servicemen, and by "the cars" they don't mean the old jalopies and corks but the sleek '40 and '41 jobs. These are the cars that are burning up bearings and throwing rods through cases.

And interestingly enough, it is no reflection on these particular cars, for everywhere else the same jobs are giving no trouble. But on the Turnpike, where you can roll mile after mile without taking your foot off the gas, rods and mains don't seem to be able to stand up.

It's purely a question of trying to make a race car out of an engine that was designed to do passenger car work. The lubrication that is adequate for slow speeds or for short bursts of high speed is not sufficient for long, sustained high-speed driving, some of the servicemen close to the Turnpike stated. One of them also emphasized that more trouble was encountered with some of the higher-

priced jobs than with the big three.

That the trouble is the result of high engine speed would seem to be borne out by the fact that very little trouble is experienced on any make car that is being driven in a conservative manner at three-quarters throttle on the Turnpike. At full throttle, but lower speed, these same cars are giving no trouble in negotiating five and six miles of steady pulling on near-by mountains.

Most of the trouble is limited to engine bearings and the illustration on this page shows what happens to a rod that seemed to prefer the fresh air on the outside of the crankcase to the hot, oil-soaked atmosphere in the oil pan.

If the owner does not continue forcing his engine after the first signs of trouble, it is generally simply a question of slipping in a new rod or rod bearing, as the case may be. But many car owners either don't know or care or realize what is happening to their engine with the result that jobbers are finding crankshaft grind-

ers highly profitable investments.

Incidentally, an idea of the extent of the bearing replacement business resulting from the high speeds on the Turnpike can be obtained from a jobber in Bedford (the halfway point) who sold more rebabbited rods of a single make and model during the first two months of the current year than he did during the entire preceding twelve months. If that figure can be projected, service business as the result of the Turnpike is six times better than the period preceding its completion.

As another example of Turnpike business one repair shop in six months handled 250 bearing jobs, all of which had been towed in from the Turnpike and that does not include jobs of other types.

However, rods and mains aren't the only parts that are giving trouble. Overheating, broken fan belts, generator failures, worn universals and noisy rears are also frequent. The term "noisy rear" is perhaps an understatement, for in several instances all the teeth

By BILL TOBOLDT



have been chewed off the pinion gear and the temperatures have gotten high enough to actually weld the pinion shaft to the bearing races. Such cases are undoubtedly due to carelessness in allowing the lubricant to get too low in the differential housing and cannot be attributed to the design of the vehicle or the high speeds attainable on the Turnpike.

Tire trouble and minor maintenance are handled right on the Turnpike but cars requiring major repairs are towed to the repair shops by special franchised tow cars. There are no shops right on the Turnpike, only special filling stations at regular intervals. The road is fenced in on both sides and there are no cross roads as all intersections have been either underpassed or overpassed.

Even during the winter and spring months, there was a fair number of overheating jobs, but with the advent of warm weather such jobs naturally increased. There have been practically no reports on burned valves or spark plugs, the reason probably being that such troubles result in missing, which the owner is willing to put up with until he reaches the repair shop in his home town.

(Continued on page 83)



What happens to a rod when passenger cars are pushed hour on hour at race-track speed. Piston and rod shown were taken from a car that quit after comparatively few miles of open-throttle driving on the Turnpike



BIG BATTERY BUSINESS

IN SMALL SHOP

Proper tests and equipment help this country serviceman boost his income

SOME service men, if they operate a small-town shop or one that is distinctly rural, have a way of scoffing at tales they hear or read about the success of a plan to increase volume and make more money.

"That stuff's all right for a shop in the city," they say, "but not for us. We're dealing with the same customers every day. We can't try any high-pressure stuff or a lot of froth. If we did, we'd go broke."

The trouble with that view of the problem is its confusion of sound merchandising with a lot of high-sounding ballyhoo and trick ap-

peals. Actually sound merchandising is always effective, regardless of where it is used, and there is no better evidence of this fact than the success Ed Spangler is making of battery service and sales in the small shop he owns and operates on a rural route near York, Pa.

Not being on a main highway, the shop must depend entirely on the patronage of the same owners month after month. Some of these owners are farmers, for the shop is close to a prosperous farming section, and some are townspeople who knew Spangler when he worked for a shop in the city. Spangler

knows all of them by their first names and could not try any trick stuff, even if he wanted to. Still his battery sales, for a shop so small, are remarkable.

Last winter, his first as operator of his own shop, he was able to dispose of 8 to 10 batteries a week. That meant a sale a day and sometimes two. This summer—the off season for battery sales—he has been able to move a battery or two every week.

When you compare the discount on the sale of a first-line battery with the profit on the sale of parts and labor, you arrive at the fact that selling a new battery is the equivalent of doing several hours' laborious mechanical work. Selling a battery is a matter of minutes, plus a little thinking.

Spangler has only three rules for
(Continued on page 78)



"Look, dear—not a scratch on the fenders!"

OVERHAULING THE 1941

PLYMOUTH DIFFERENTIAL

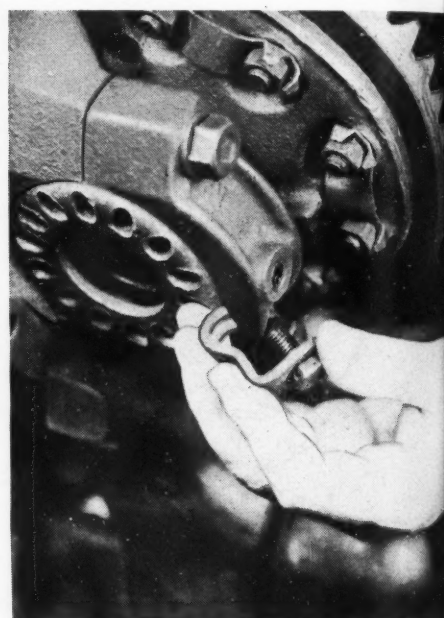
Clear-cut instructions in photographs that will enable you to service this unit correctly in the shortest time



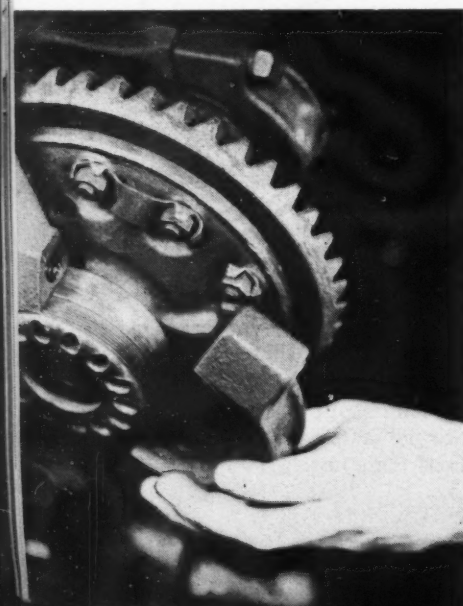
1. Remove universal joint companion flange retaining nut from pinion shaft.



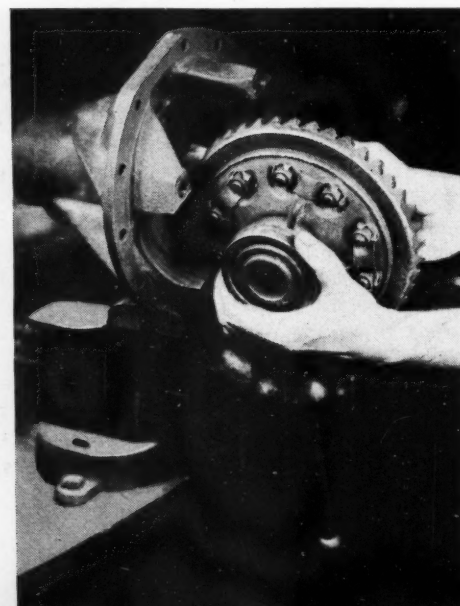
2. Tap companion flange from pinion shaft, using a soft-face hammer or a puller.



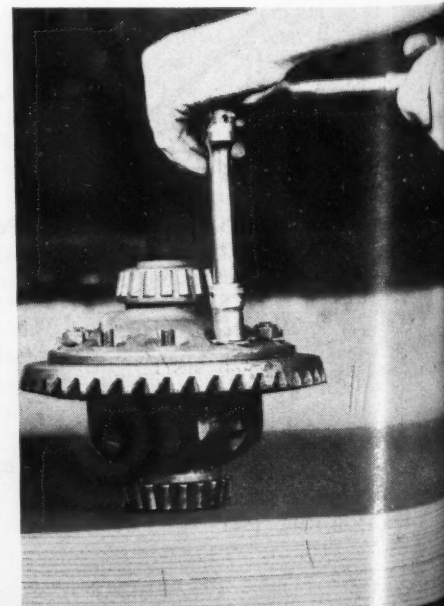
3. Remove differential side bearing adjusting nut locking clamp.



4. Remove bolts and lift off side bearing cap and pull out adjusting nut.



5. Remove ring gear and case assembly from differential housing.



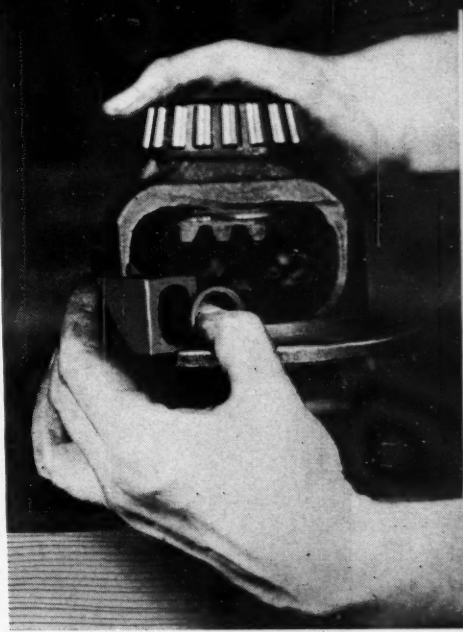
6. Remove ring gear to case attaching bolts and lift ring gear from case.



7. Drive out the lock pin holding the differential pinion pin to case.



8. Remove the differential pinion pin from the case, pushing the locked end out.



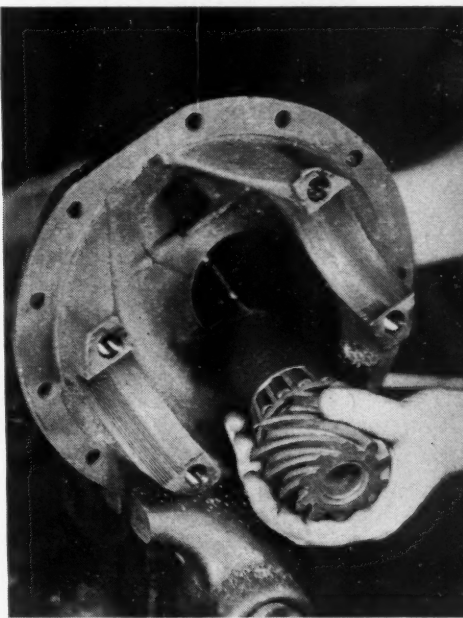
9. Remove the rear axle shaft thrust block and the two spacers.



10. Remove the differential side pinions and the dished thrust washers.

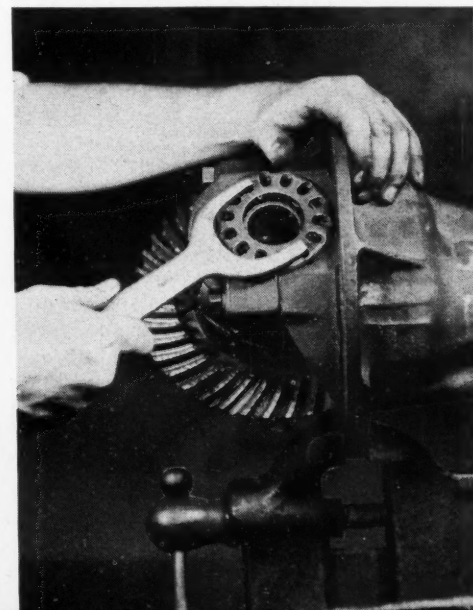
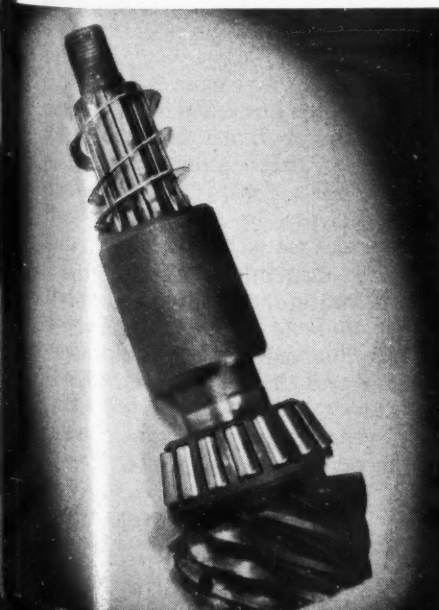


11. Remove the side gear or axle gears and the flat thrust washers.

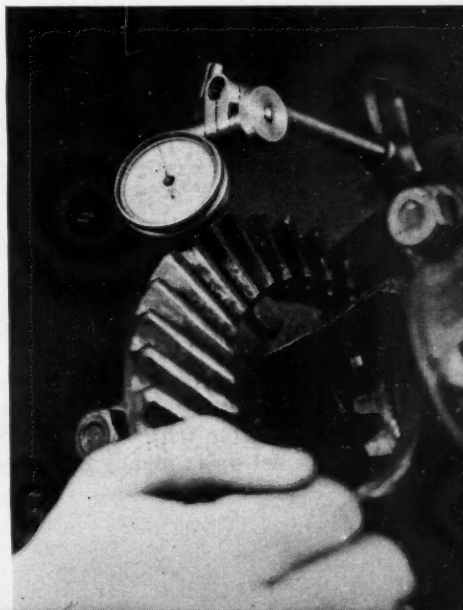


12. Remove the pinion and shaft assembly from the rear of the differential housing.

13. Showing drive pinion and shaft assembly with bearing spacer and adjusting shims.



14. When reassembling, tighten the side bearing adjusting nuts to eliminate side play.



15. Check backlash between ring gear and pinion with a dial gage.



READY FOR THE SERVICE

AT a time when many car dealers are frankly concerned about their ability to make progress during the approaching calm in new-car production, it is encouraging to run across such an enterprise as the Seven Star Garage, just outside Carlisle, Pa. This business, despite its name and even its appearance, is a car dealership, differing from the ordinary run only because service has deliberately been allowed to take precedence over sales.

But it is that difference which enables W. J. Fetter, who founded and still operates the business, to face the prospect of new-car scarcity with utmost confidence. If service is going to be the better end of the business in the indefinite future, Fetter with his remarkable service set-up is ideally equipped to

A dealer who has seen trends change bids for continued success with new set-up built around a service shop

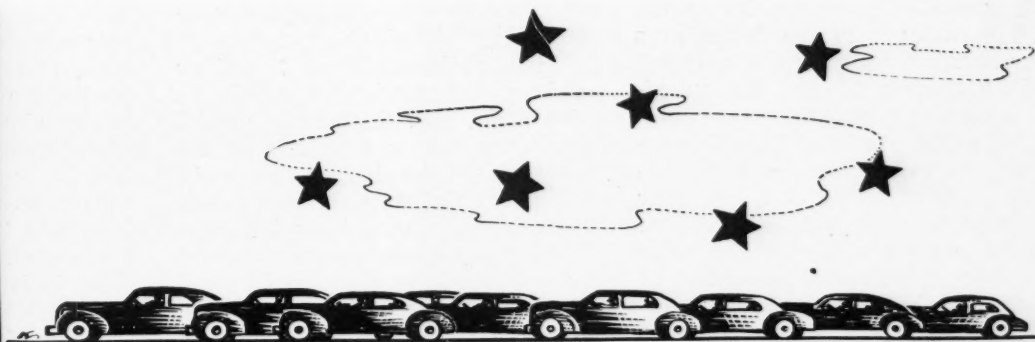
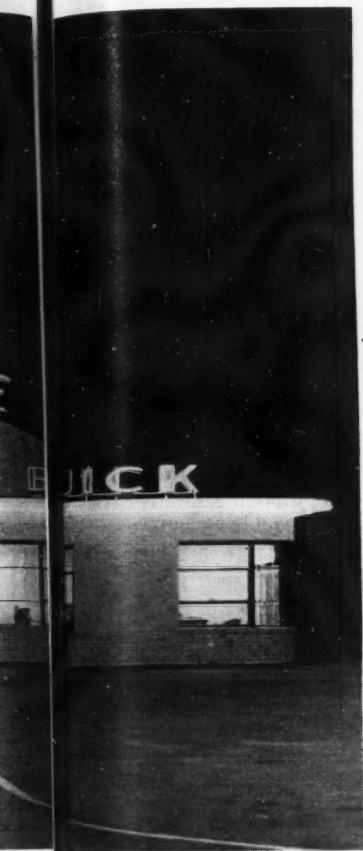
By J. EDWARD FORD

take advantage of the opportunity.

The decision to elevate service to a dominant position was reached not to meet the present crisis but as the result of 25 years' observation as a car dealer. Fetter took his first factory franchise in 1914 and from that time until 1939 he con-

ducted a dealership within the borough limits of Carlisle. His set-up was the one most favored by dealers. The sales room was out front and the shop used room that was left.

Two years ago it became clear that the set-up was not right. Ser-



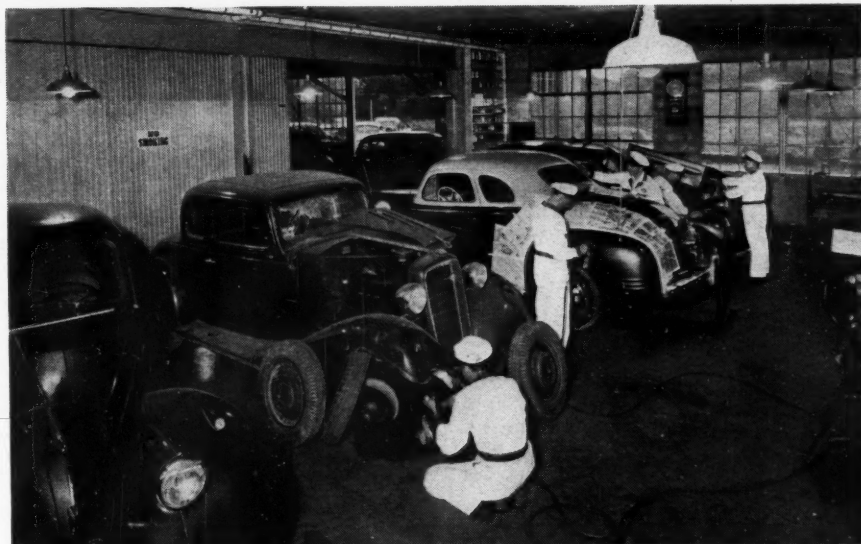
BOOM

vice was becoming more and more important, and there was no room at the old location to enlarge the shop. Fetter made a bold decision. He built a new plant just over the borough line and a mile from the old one.

This new shop is as fine as automobile experience and modern architectural skill could devise. When plans were being drawn, the thing uppermost in Fetter's mind was not the convenience of car salesmen but the needs of the service men.

The striking highway front of the building contains no show windows but two wide doors. A service customer driving through one or the other of the doors is greeted immediately by the service manager.

(Continued on page 78)



Sales floor that became a service shop. Space once used to display cars is now given over to testing and tuning up cars of all makes. Though spacious, it is frequently crowded by service customers and their cars. The lubrication lifts, always spotless, are a profitable unit in the service plan. At top, the body shop, with wide doors for easy handling of cars, a department that is constantly crowded to capacity.

MAJOR accidents that cause damage to the frame of a car invariably spring the body out of line. Even though the out-of-line condition may be only slight, it should be corrected to avoid sagging or poorly fitting doors or binding of door, windshield and rear quarter window glasses. In some cases, the correction can be made without extensive disassembly of body parts.

In severe cases, however, where the body is badly out of line, it is necessary to remove the doors and all glasses as well as the upholstery panels in order to do a good job of bringing the body structure back in line.

When the body has been stripped, the alining measurements are made by comparing diagonal distances between given points. For example, the distance from the bottom of the front-door hinge pillar to the top of the front-door lock pillar should be the same on each side of the car; the distance from the top of the right front-door lock pillar to the bottom of the left front-door hinge pillar should be the same as the distance from the top of the left front-door pillar to the bottom of the right front-door hinge pillar.

For the purpose of making this point clear, the principal points of the body shown in Fig. 1 have been designated as "A" pillar, "B" pillar and "C" pillar. The body straightening operation should start with

the front structure, or the area controlled by "A" pillar.

Place chalk marks on the pillar and on the windshield panels as shown in Fig. 2, taking careful measurements on each side of the body so that the chalk marks are in the same relative positions on each side. Then, with a body jack, the front end structure can be forced back into line, so that the diagonal distances between the points indicated by the chalk marks are the same in any direction. Fig. 3 shows the method of checking the angle of the windshield post to be sure that the door opening is the proper size and that the windshield opening is true, so that the glass will fit properly.

Measurements are taken with a tram as shown in Fig. 3. It consists of two lengths of steel tubing, one sliding inside the other, the outside tube having a clamp screw to hold the inner tube in position. This instrument can be purchased from body tool suppliers, or can be made in the shop from steel tubing purchased locally.

After getting the section controlled by "A" pillar into line, the next step is to move back to "B" pillar. Place more chalk marks on the "B" pillars, top and bottom, as shown in Fig. 4, and make diagonal measurements from the top of one to the bottom of the other, and from the top of "B" pillar to the bottom of "A" pillar on the same

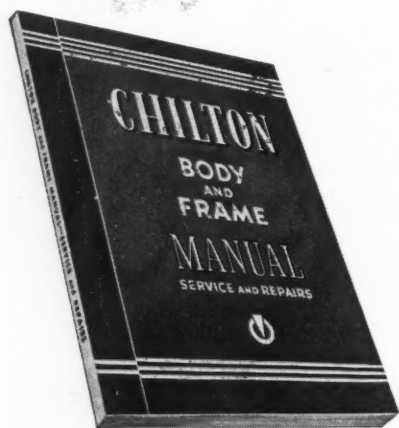
side and on opposite sides; also measure from the bottom of "B" pillar on one side to the chalk mark on the top of "A" pillar on the opposite side, as shown in Fig. 5. Measurements can be taken from the body bolts located at "A" pillars, as these form a permanent base and it is easier to place the tram against the head of the bolt than it is to hold the tram to a chalk mark.

The difference between the distances of two corresponding diagonal measurements is the amount the body is out of line. When the correction is made, the body should be forced back slightly more than half of this amount to allow a little for "spring back" of the structure.

The rear section of the body controlled by "C" pillar, and including the luggage compartment, can be checked in the same manner, as shown in Fig. 6, from body bolt to deck-lid opening, diagonally, and from body bolt to the rear of the opening for the rear quarter window.

As corrections are made in the "C" pillar section of the body structure, there is the possibility that they will affect the alinement of the "B" section, so it is necessary to go back and check the "B" section frequently. This is also true of corrections made in the luggage compartment section—they may affect the work done in the "C"

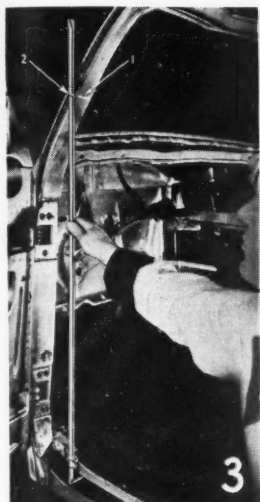
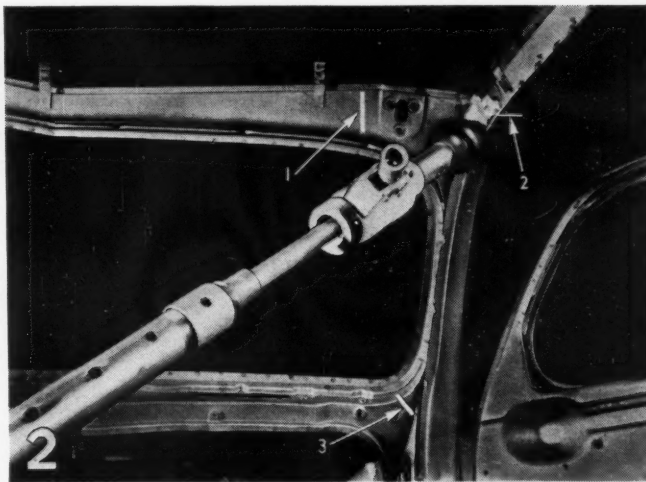
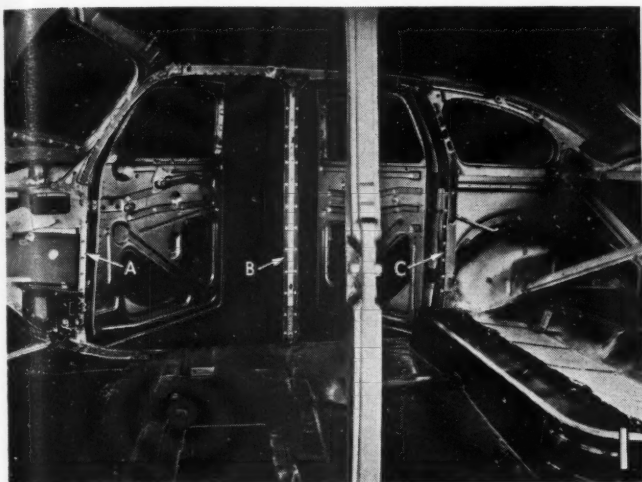
(Continued on page 83)



This article, and others in Motor Age, supplements the service information incorporated in the Chilton Body and Frame Manual.

**Here is the way to check
for body misalignment and
the simplest and quickest
methods for bringing the
structure into correct line**

ALINING HINTS



1. Indicating the three major sections of the body as "A" section, "B" section and "C" section.

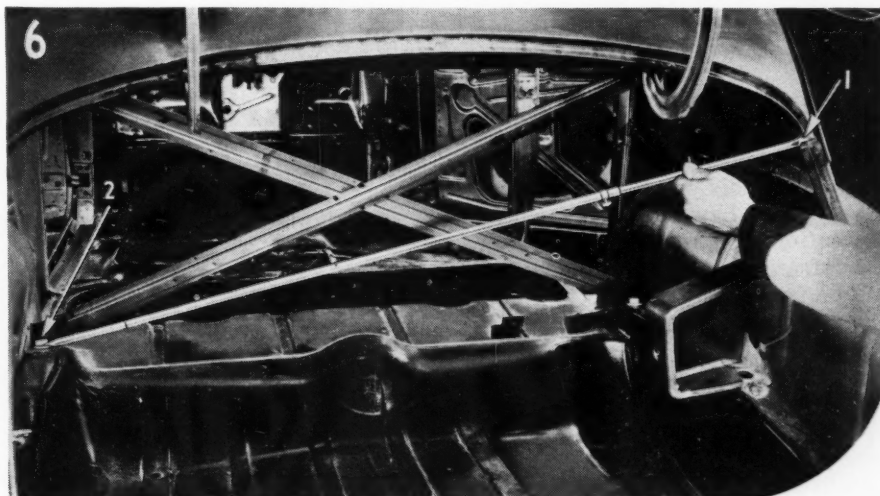
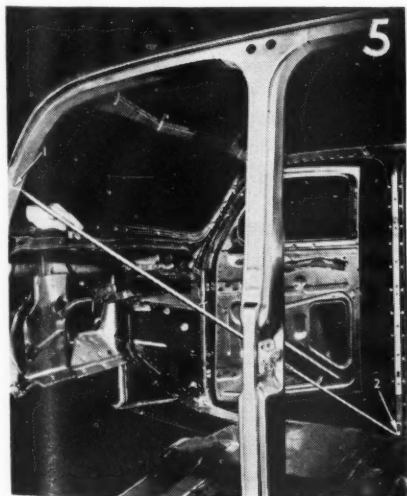
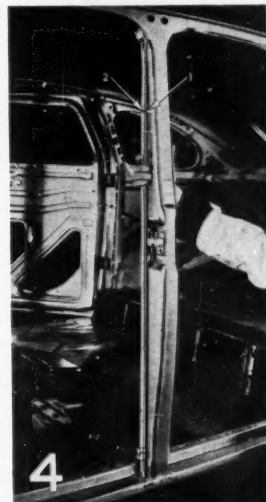
2. Place chalk marks on the body structure at corresponding points to be used in checking measurements.

3. Checking the angle of the windshield post to see that the windshield frame is true.

4. Checking the "B" section from the chalk marks on the lock pillar, to true this section.

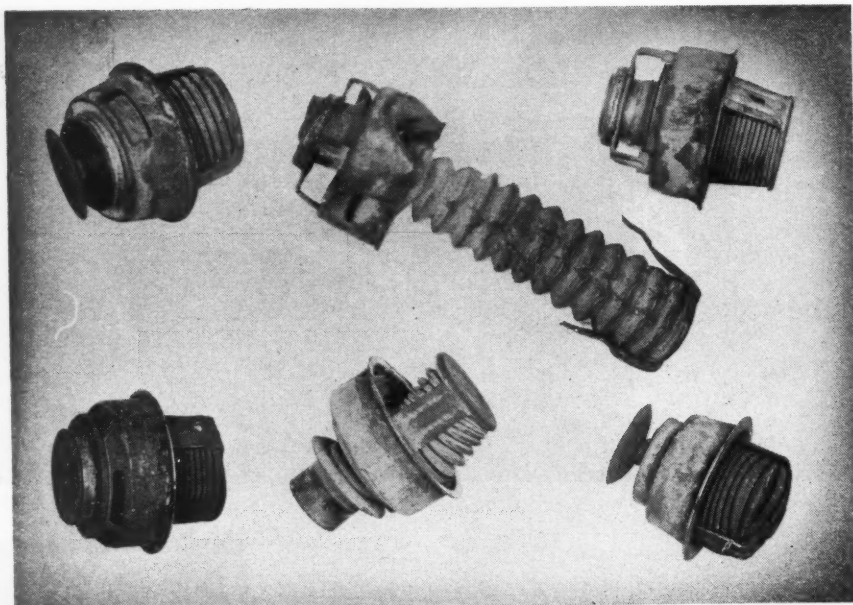
5. Diagonal measurements from "A" section to "B" section prove trueness of straightening.

6. Checking the rear section of the body controlled by "C" section. Body bolts used as markers.

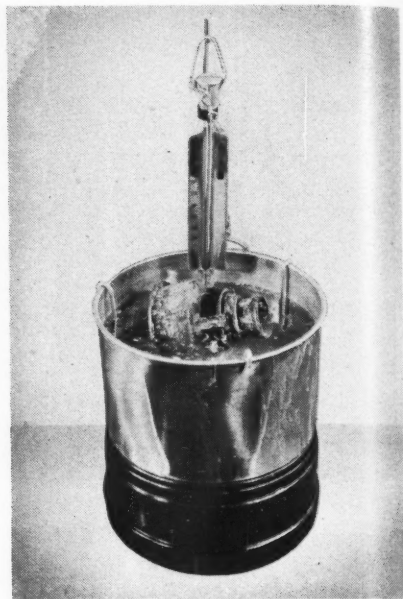


ON BODY SERVICE

SEPTEMBER, 1941



These thermostats failed because of corrosion or overheating. Note that in some cases the valve stuck in the open position, and in others it stuck in the closed position, cutting off water circulation entirely. Overheating will cause the bellows to expand and burst.



Test the thermostat in hot water, and note the temperature at which the valve starts to open. Also check for smooth operation.

TEST THE

THERMOSTAT

REGARDLESS of the make of car or the type of anti-freeze which the individual car owner will be using this winter, the cooling system will have to be given special attention if it is to give car-owner satisfaction. Above all, it will have to be thoroughly cleaned so that it will operate at peak efficiency. Particular attention should be given the thermostat, to be sure it is the proper type to operate in conjunction with the type of anti-freeze solution used.

The standard equipment thermostat is calibrated to prevent engine temperature from dropping below 135 or 140 deg. In cold weather, this is not high enough to supply the interior of the car with heat from the hot-water heater. It is necessary, therefore, that a thermostat that will start to open at 160 deg. or higher be used in all cases where the car is equipped with a hot water heater.

The majority of present-day cars

To prevent cooling system troubles, this unit must be checked to make certain it operates properly with a particular type of anti-freeze

use the block type of thermostat, which is non-adjustable. The opening temperature is stamped on the thermostat, but to be on the safe side it is advisable to test the unit yourself for two reasons: First, to be sure that it opens at the tem-

perature indicated, and, second, that it opens with a smooth, steady action.

The unit can be tested by placing it in water, with a thermometer. Heat the water and watch the operation of the thermostat, keeping



By BOB HANKINSON

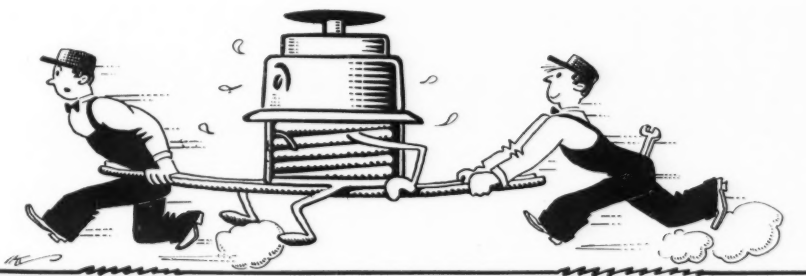
being equipped with hot-water heaters, a thermostat that opens at that temperature should be used. It is important that you know the type of anti-freeze solution being used before selecting the proper thermostat, however, because a 50-50 solution of alcohol and water will boil at approximately 181 deg. This means that a high-temperature thermostat cannot be used with an alcohol anti-freeze of this proportion, since the solution would boil away rapidly.

It must be remembered that there is a temporary increase of about 20 deg. in the temperature of the cooling system solution when the car is stopped after a run. If the engine has been operating at a temperature of 165 or 170 deg., and the temperature goes up to 185 or 190 deg. after the engine is stopped, the cooling system solution will boil if a low boiling point solution is being used. This results in loss of the solution, and unless this loss is replaced, the engine will boil the next time it is driven, or will freeze up due to the loss of this protection.

Some thermostats are of the adjustable type, and these can be easily adjusted to operate at the proper temperature consistent with the type of anti-freeze solution being used.

Be sure to seal the flange of the thermostat with a new gasket when installing the block type. Inspect the unit to be sure that the valve seats properly when it is closed.

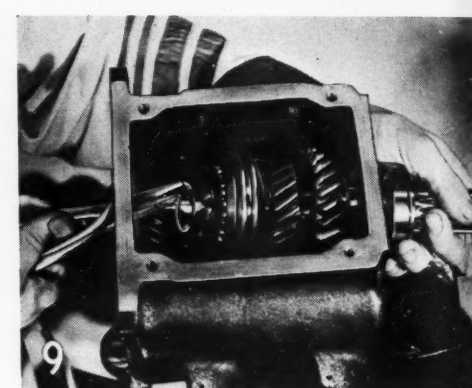
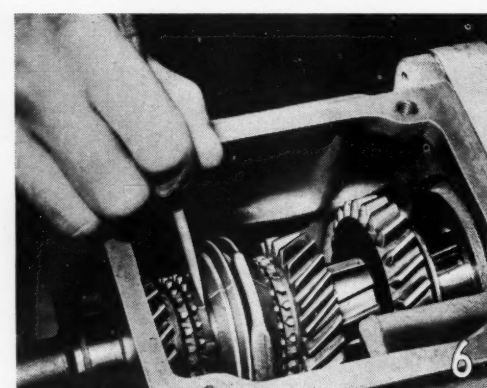
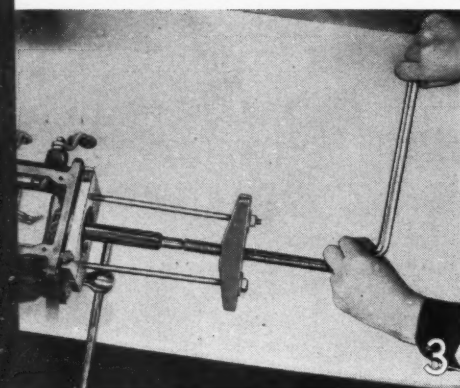
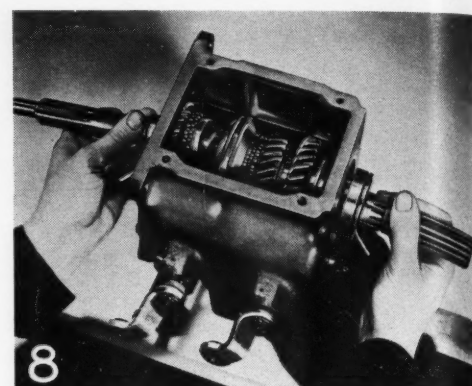
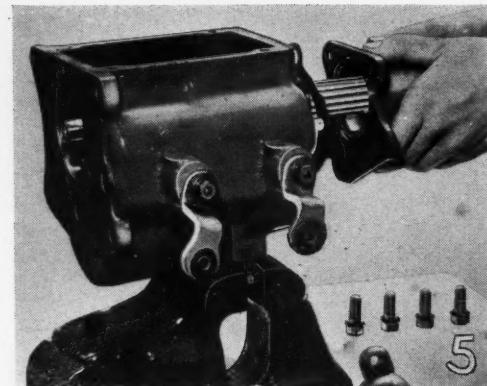
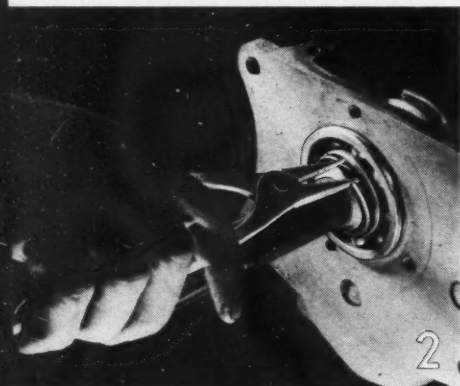
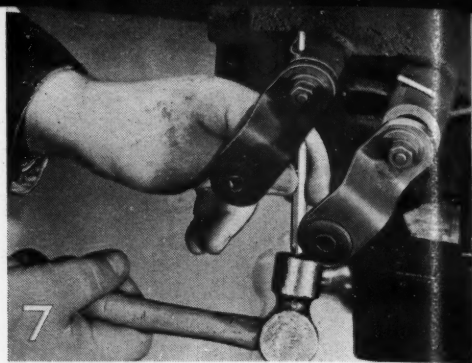
When installing anti-freeze, care should be exercised to be sure that no air pockets are allowed to form in the cooling system. They give a false indication of the solution level, and lead to overheating when the car is operated on the road. Run the engine long enough for the operating temperature to open the thermostat, and then fill to the proper level. Since the solution will expand when it is hot, be sure to leave enough space in the top tank of the radiator to allow room for this expansion without forcing the solution out the overflow tube.



an eye on the thermometer so that you can determine the temperature at which the unit starts to open. Then observe the action of the thermostat to see that it opens smoothly, and continues to open until it reaches the wide-open posi-

tion. If the action is jerky, the thermostat should be replaced with a new one.

The most efficient engine operating temperature is approximately 180 deg., so for cold-weather driving and particularly in cases of cars



TRANSMISSION OVERHAUL

1. Remove transmission cover, main shaft bearing retainer flange, and bearing retainer outer snap ring.

2. Remove front bearing retainer inner snap ring with thin-nose pliers. Use new ring when reassembling.

3. Use special bearing puller to pull front bearing, being careful not to damage synchronizer.

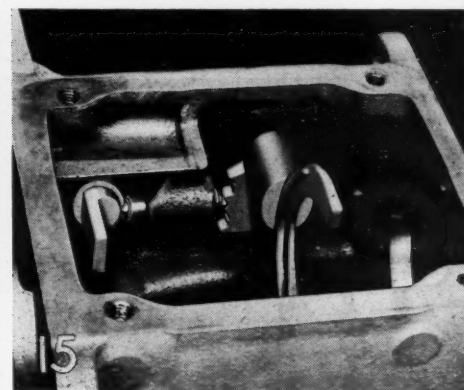
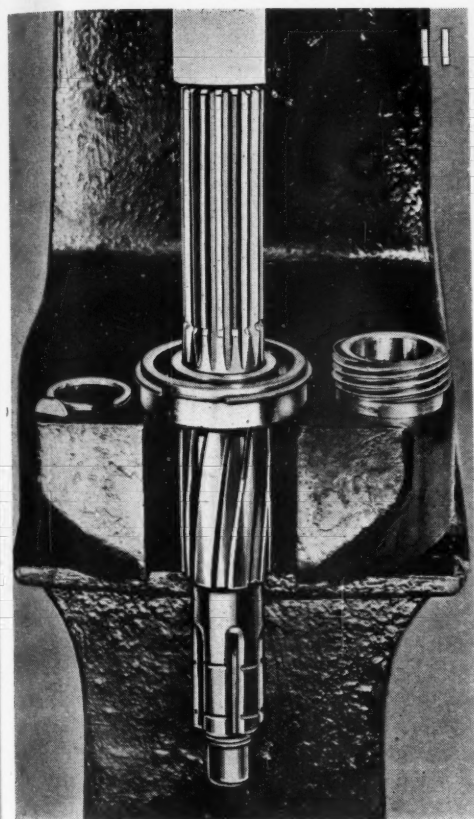
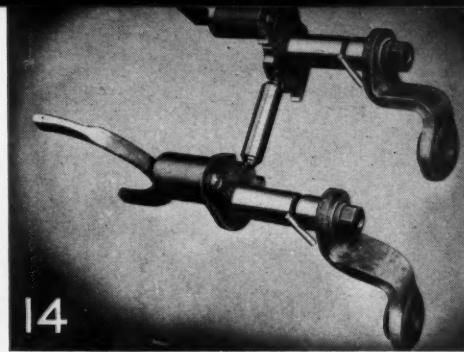
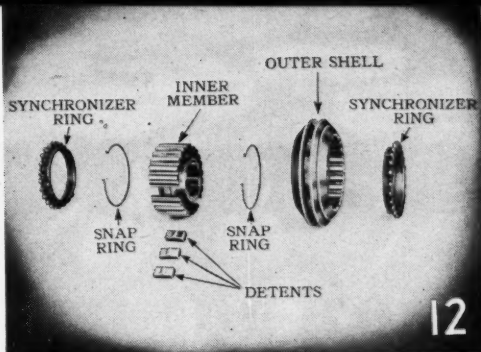
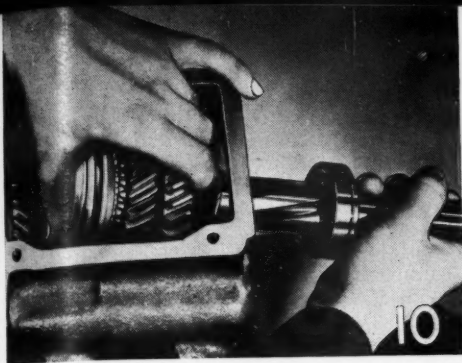
4. When reinstalling front bearing, press section of pipe against inner bearing race. Protect synchronizer.

5. Remove speedometer pinion and four cap screws, and pull off rear main shaft housing.

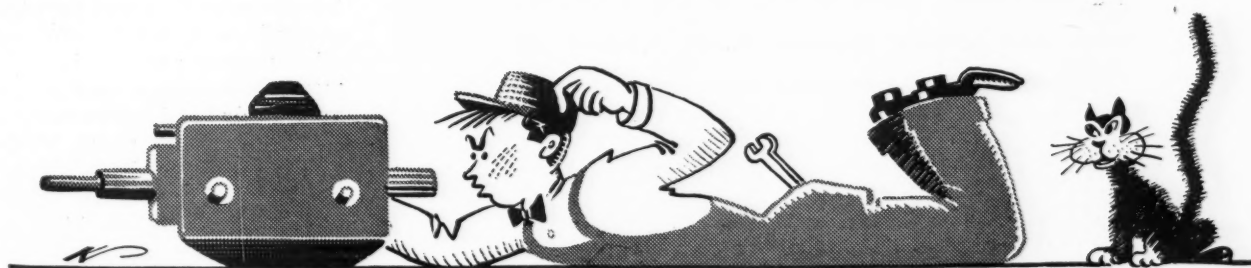
6. With chalk or white paint, mark position of synchronizer ring and outer shell. Line up when reassembling.

7. Use a small punch and remove shifter shaft lock pins by driving them out from underneath housing.

8. Tilt main drive gear so it clears countershaft gear, and remove gear and shaft assembly.



A picture story you'll want to keep. It explains how to disassemble the conventional transmission used on the 1941 Studebaker Champion



9. Remove second and high shifter fork, and remove snap ring from front of main shaft.

10. Hold gears to prevent damage from dropping into case, and withdraw main shaft toward rear.

11. Remove snap ring and speedometer gear from main shaft, and press shaft through bearing. Be careful not to damage bearing when applying pressure.

12. Disassembled view of parts of synchronizer assembly.

Commander and President models similar, but of slightly heavier construction.

13. Remove countershaft lock and drive shaft out through rear of case. Drive reverse idler shaft out through rear.

14. Showing transmission gear shift mechanism assembled in neutral position.

15. Note positioning of first and reverse shifter fork, in neutral position.

HEAVY OIL OR LIGHT?



**An authority cites a few of the reasons
why one grade cannot meet winter as
well as summer demands**

By FREDERIC R. SPEED

Pennsylvania Grade Crude Oil Association

UNTIL about 10 years ago, the lubrication of motor vehicle engines at temperatures of 32 degrees Fahr. and below gave much concern to both engine builders and oil refiners. Up to that time, the oils available for automotive engines were heavy bodied, and at freezing temperatures and below were so viscous that more power than was usually available from the battery was required to break loose

the piston from the tenacious oil mass which sealed it in the cylinder. If this could be accomplished, it was still unlikely that the battery had sufficient power to spin the engine fast enough to start it to fire.

Even if the engine could be made to run under its own power, the cold oil was so viscous that it would not flow readily, if at all, and could not be picked up by the pump and delivered to the bearings until the

engine had run long enough to warm the oil and thus make it pumpable. During this period, the only lubrication available to the bearings and cylinder walls was the small amount of oil remaining on them after the engine had last stopped. Rarely was this amount of oil sufficient to insure even "thin film lubrication." Because of this, a very high rate of wear was usual during the starting and warm-up period with serious engine damage not unusual.

The introduction of light bodied oils, especially refined for winter use and treated to insure ready flow at low temperatures has alleviated this situation. Further improvements have made it possible to produce oils in the S.A.E. 10W and 20W viscosities which break away easily at low temperatures, allowing the engine to start, and flow readily to assure adequate lubrication during the critical starting and warm-up period.

Private owners and fleet operators were somewhat slow in accepting these oils because they were accustomed to more viscous ones and were doubtful that these very light oils could lubricate and protect the engine satisfactorily. Considerable promotion and sales effort was required before wide public acceptance was attained. However, once the benefits in assured starting, reduced wear, and improved engine life were appreciated, the use of these oils at low and moderate temperatures became widespread.

During the past few years, there has developed a trend for still more general use of S.A.E. 10W and 20W oils and they are now being recommended by many engine builders and widely used for summer service at temperatures up to 90 degrees Fahr. and even above. This practice has been possible by changes in engine design, providing smaller bearing clearances and the improved fitting of piston rings, so that oil consumption with these light oils can be maintained at a low value.

Concurrently the matter of oil consumption, particularly in passenger car engines, has been so emphasized and in some cases carried to such extremes that the amount of oil permitted to reach the upper part of the piston and the top ring is often inadequate for safe lubrication. The bearing surfaces are therefore not continuously separated by a complete film of oil and there is no flow for scavenging the

(Continued on page 70)

NEW profit makers

PARTS TOOLS EQUIPMENT ACCESSORIES

Charger Improved

To meet the demand for a portable, car-side fast battery charger equipped for complete battery analysis, W. D. Foreman, 54th & State Sts., Chicago,



Ill., has announced the addition of a built-in voltmeter and high resistance breakdown tester as optional equipment on present models of Foreman battery boosters.

Exhaust Gas Analyzer

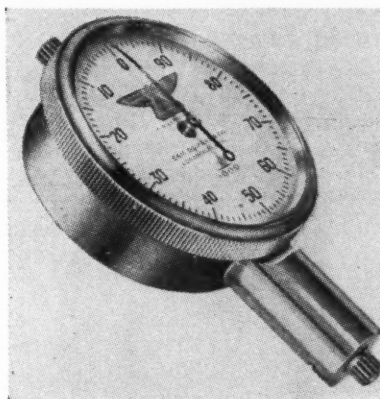
The Hays Corp., Michigan City, Ind., has introduced a new instrument for analyzing the exhaust gas of an automobile to enable the mechanic to adjust the engine for the most efficient air-fuel ratio. The instrument, known as the Orsatomat, makes the analysis in from 15 to 30 seconds, according to the manufacturer, and shows the total percentage of oxygen and carbon dioxide by means of a black pointer on



the dial, and the percentage of oxygen alone by a red pointer, the difference between these two readings being the percentage of oxygen to fuel, or the air-fuel ratio.

Lining Life Gage

One of the newest products to be introduced to the trade is the Mile-O-Gauge for determining the useful life of brake lining now on the shoes. The instrument, as illustrated, is placed against a rivet head to determine the thickness of the lining above the rivet. Then, by knowing the mileage the car has been driven with this lining, a Mile-O-Gauge chart tells the number of miles of useful life remaining. Made by Sam Dupree & Co., 1421 S. Flower St., Los Angeles, Cal.



Whiz Adds to Line

Two new products have been added to the line of Whiz automobile chemicals manufactured by R. M. Hollingshead Corp., Camden, N. J. Speedry, a new washing compound, is said to reduce car washing time greatly since it cleans thoroughly without rubbing, and dries with chamoising. Sold in concentrated form, 2 oz. in a bucket of water are said to be sufficient to clean the dirtiest surface. Priced at 75 cents per pt., \$4.50 per gal.

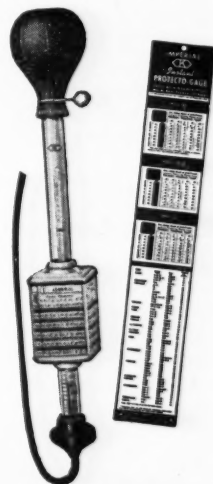


Whiz Metal Weld is compounded to seal permanently cracks in aluminum alloys, cast iron and steel such as porous cylinder heads, cracked valve ports, water jackets and engine blocks, etc. Introduced as a heavy liquid into the circulating system, it seeps out through pores and cracks and dries into a hard, metal-like substance upon coming in contact with the open air. Priced at \$2 per pt.



Imperial Freezetester

The new model No. 546-T high speed freezetester for testing anti-freeze solutions has been announced by The Imperial Brass Mfg. Co., 1220



W. Harrison St., Chicago, Ill. In addition to testing the solution, the instrument shows how many additional quarts of anti-freeze are needed for protection to any given temperature. Operates quickly and accurately, and tests all brands of anti-freeze. A metal guide chart, Protecto-Gage, is furnished with each tester.

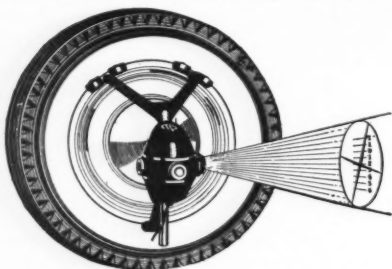
Alines Wheels With Light

A new instrument employing the light-beam method of alining has

NEW profit makers

PARTS TOOLS EQUIPMENT ACCESSORIES

been announced by Thompson Products, Inc., 2196 Clarkwood Rd., Cleveland, Ohio. Known as the Magnaliner, the unit consists of a powerful projector unit with magnetic shoes to attach it to the rim of the wheel. The unit flashes a bright beam of light on a steel chart and the front or sides of the vehicle. A cross-hair image in



each light beam, focused on diagrams on the charts, instantly shows the exact condition of alinement. Since the image is greatly magnified, the result is easy to read for both the mechanic and the car owner. Checks caster, camber, toe-in, king pin inclination, turning radius, rear wheel tractage, etc., easily and accurately.

Leonard Adds to Spark Plug Line

The Leonard Spark Plug Co., 148 Summit St., Newark, N. J., has announced the addition of two new 10 mm. spark plugs to fit the 1941 Chevrolet passenger car line and the 1941 heavy duty Chevrolet truck line. Outstanding claim of the manufacturer is



that the gap setting of these plugs does not change in service, due to the fact that the plug fires from the sides

of the electrodes on two flats instead of on the ends, which permits the ground electrode to change in the vertical direction, thus maintaining original gap setting.

Sealing Compound

The Puritan Co., Inc., Rochester, N. Y., has added two new products to its line of automobile chemicals; Gaska-Seal No. 1, and Gaska-Seal No. 2. Supplied in paste form, No. 1 is the hardening type and No. 2 is the pliable type. Both may be used in place of gaskets to repair defective gaskets, or as a means of obtaining a more nearly perfect seal when used with gaskets, according to the manufacturers. It is claimed these products have a high resistance to pressure, heat and action of solvents.

Reflector Has Plastic Lens

A new reflector with a lens made of Lucite has been announced by the K-D Lamp Co., 610 W. Court St., Cincinnati, Ohio. This new lamp is said to have greater reflecting power than former models, and will not break un-

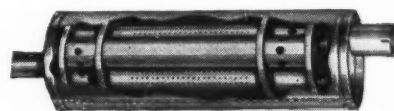


der normal impacts. Another feature is that the facets on the back of the lens need no silvering so that moisture, salt spray and dust do not mar its efficiency. The lens is set in a heavy, deep-drawn housing to give added protection.

Replacement Muffler

The Arnold Haviland Co., Defiance, Ohio, has introduced a new line of

super deluxe mufflers for the replacement market. These new mufflers have shells made of heavy gage sheet steel, coated with molten aluminum to resist acid corrosion and rust.



Crimped locked seams and turned heads insure against leaks and blow outs. The inner construction is designed for low back pressure and quiet operation. A catalog describing the complete line will be sent upon request.

Nor'way Adds New Products

Commercial Solvents Corp., 17 E. 42nd St., New York City, has announced the addition of four auto-



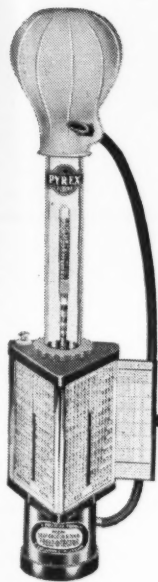
motive chemicals to its line of Nor'way products. They are Nor'way cooling system cleaner for badly clogged cooling system; Nor'way quick-flush for cooling systems, which

need milder cleaning; Nor'way anti-rust; and Nor'way stop-leak. These new products are displayed in an attractive, metal, three-color display rack which can be placed on the counter or out by the gas pumps.

Kant-Rust Announces Peptane

A new product, known as Peptane, has been announced by the Kant-Rust Products Corp., Rahway, N. J. When added to the crankcase oil, Peptane is said to provide greater oiliness by coating moving parts with a sturdy film of oil, give higher film strength through reduced temperatures, and to act as a solvent for sludge and varnish formations. One quart of Peptane is required for a crankcase having a capacity of six quarts or less, and two quarts for capacities in excess of six quarts.

Anti-Freeze Tester



The new model anti-freeze tester made by E. Edelmann & Co., 2332-56 Logan Blvd., Chicago, Ill., is ready for the trade. Incorporating many of the outstanding features of past models, the new instrument has a larger bulb, replaceable thermometer, rubber cushion base, blown float beads and a shorter tube jar for easier cleaning. It has the built-in flashlight and the capacity corrector chart found in former models. Will test all types of anti-

freeze preparations.

Insert Bearing Has New Features

Addition of the new micro bearing to the line of Monmouth steel-backed insert-type bearings has been announced by Monmouth Products Co., 1931 E. 61st St., Cleveland, Ohio. This new micro bearing has a thinner babbit lining and a heavier steel-back, which is said to contribute to longer life and greater load-carrying capacity.

Ridge Reamer

A new and improved type of ridge reamer is now being offered to the trade by the Ramsey Accessories Mfg. Co., St. Louis, Mo., at a special price when included in a deal of Ramco 10-Up piston rings. This new reamer is said to fit all cylinder sizes from 2.6 in. to 4 in., and is available with over-size jaws to take up to 5 in. It is adjustable at the top, and has easily adjusted brackets, cuts quickly and easily.

Tire Tools

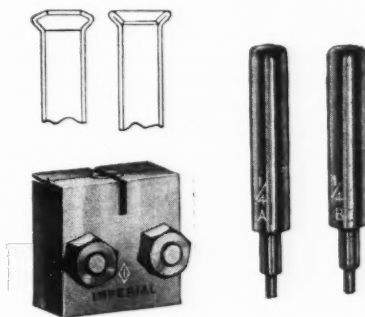
Two new tools designed to loosen tire beads from rims so as to facilitate removing tires without removing wheels have been announced by Weaver Mfg. Co., Springfield, Ill. Two different principles are employed in



these two tools, and either tool is a complete unit. One is designed for all types of drop center rims as used on passenger cars, and the other handles truck, bus and tractor tires as well as passenger cars. The tool illustrated is the shock type, and consists of a steel pin fitted with a rubber safety handle and a heavy sleeve which is used to deliver the shock.

Tube Flaring Tool

A new type of flaring tool, designed for making approved type double flares on steel tubing for gas lines and brake line connection work has been announced by The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill. Three sizes are available for tubing 1/4 in., 5/16 in., and 3/8 in.



Each size includes one die block to hold the tubing in position, and two punches. Price range from \$4.50 to \$6.25. Identified as catalog No. 93-FB.

Tire Pumps

The Monroe Auto Equipment Co., Monroe, Mich., has recently introduced a new line of hand tire pumps. Ranging in size from 1 1/4-in. barrel to 1 3/4 in., the new pumps are equipped with slip-on tire connection and either solid or folding-type base, and with 6-in. and 8-in. handles.

Bendable Rubber Hose

The United States Rubber Co., Rockefeller Center, New York City, claims that 90 per cent of all radiator hose replacements can be made now with six sizes, through the use of new Multi-Flex hose just announced by the company. All types of bends—sharp, long, and double reverse curves—can be made. The special spiral wire coil construction keeps the curves rigid. It is also stated that this new hose will withstand not only boiling water, but boiling mixtures of water and anti-freeze solutions.

Anti-Rattle Spring

An anti-rattle horn button retaining spring has been announced by Champ Items, Inc., 6191 Maple Ave., St. Louis, Mo., for application on the

1941 Chevrolet. Listed as Item No. 413, this unit is a coil spring to replace the rubber band that fits around the outside of the die-cast supports. Item No. 413T is a sponge rubber doughnut installed under the horn button on trucks.

New Purolator Deal

A new Purolator "Universal" assortment which will service most of the passenger car engines equipped with a Purolator unit has been announced by Purolator Products, Inc., Newark, N. J. The U-4 assortment includes one NE-1517 Purolator, two N-34 elements, two N-37 elements and two N-15 elements. All are packed in a display carton and are accompanied by sales helps, including an outdoor metal sign, a full color display card and envelope stuffers.

Casco Has New Lights

The introduction of two new products, driving lights and fog lights, has been announced by Casco Products Corp., Bridgeport, Conn. The driving lights are designed for use on cars prior to the 1940 models, which did not have the sealed-beam lights. When used in conjunction with the equip-



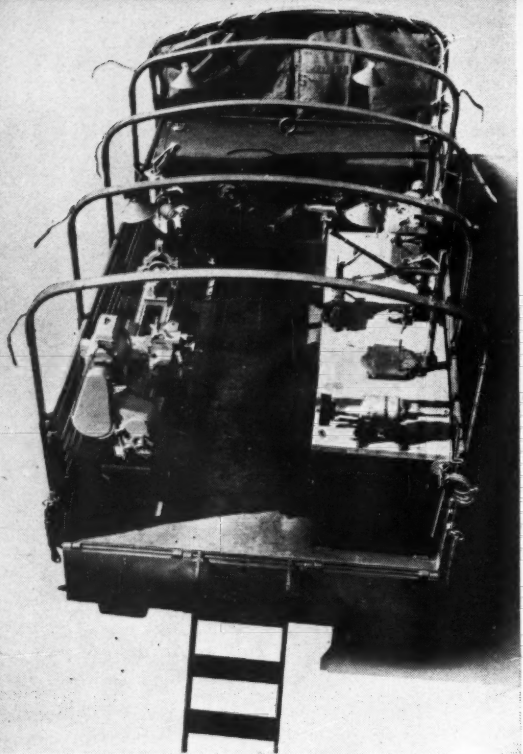
ment headlights, the manufacturer claims that night driving visibility is equal to that of cars equipped with sealed-beam headlights. Identified as No. 205-2, the lights carry a list price of \$9.00 per pair.

The fog light, designated as Model 205-F, also uses the sealed-beam construction, with amber lens. It is said



to improve vision in fog or adverse weather, and to direct a concentrated light along the right side of the road. Sold in pairs at \$10.00, or individually at \$5.35.

NEWS

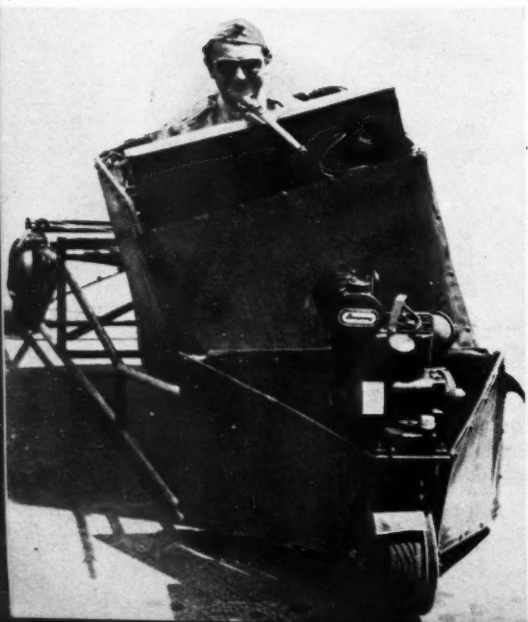


ROLLING SHOP. Army's new truck shop contains lathe, brake reliner, vise, drill stand, grinder, arc welder, valve refacer, and power generator for service in field.

WAR CANOE. Men of the Second Engineer Battalion ferry truck across a Texas River on raft they have just built on the spot.



GROUNDLING. A fledgling Army gunner learns to shoot without going aloft. The Reelx Gunnery Trainer mimics plane actions.



SERVICE CURB

PPULLING his authority out of the hat of the World War Trading with the Enemy Act, President Roosevelt has ordered regulation of installment selling. Details are still being worked out by the Federal Reserve Board, but the restrictions so far proposed threaten little harm to the financing of new and used cars. Such dangers as appear are those which any business sees in regulation and the possibility that a little regulation will breed more. Service Curb

It is not possible to deny that installment buying tends toward inflation. An installment purchase creates a debt and debt is always inflationary. Yet Americans must be pardoned if they wonder how great an effect installment buying of necessities or even the comforts of life can have when compared with such obviously inflationary governmental tactics as devaluation of the dollar and enormously increasing the public debt.

A report of a special committee of the Chamber of Commerce of the

United States, recently released, insists that installment buying can have little effect, since this type of selling is estimated at only five billions annually. Furthermore, the committee found, goods involved in this type of buying are principally durable, such as automobiles, furniture, household appliances, and radio.

Finance companies are just as alert as the administration to recognize the dangers of soft credit, and the leading finance companies have voluntarily tightened up credit terms. This is more than can be said of certain government agencies, according to the Chamber of Commerce. The Electric Home and Farm Authority, its committee says, extends payments on domestic appliances such as refrigerators, washing machines, and so on over a period of 48 months. Even automobile financing, which is often held up as a horrible example of credit run wild, has never extended payments beyond 30 months and that occurred in the depths of the 1929 depression.

Automobile servicemen have a deep interest in this question of installment selling. Such sales as yet do not con-

LOCK UP. When Guy Sheldon, who operates this service station at Buffalo, N. Y., closed at 7 p. m. in compliance with new gasoline curfew, he had first to buy these padlocks, worth more than \$18. It was the first time station had ever closed since its opening 12 years ago.



DETROIT LETTER

By ED WARNER

stitute a large part of their total repair volume, but they have become more important each year. Prospects are that they will become more important.

Give us a year or two without new automobiles—or without sufficient new automobiles—and repair bills are bound to soar. For the first time in their lives, many owners will be faced with the necessity of buying ring jobs or even of having blocks rebored. Work of that kind runs into dollars, and owners very likely won't have enough. Few shops are in position to finance their own sales and, unless regulation is sensible and credit is made available to the owner, shops will suffer from the loss of business. To that extent, the curb on installments would be a curb on service.

MR. ICKES' THUMBS

EVER since vituperative Mr. Ickes took over as czar of the petroleum industry and interested himself in motor transportation, his actions have drawn attention to his thumbs. This

REMEMBER 1934 or, better still, 1938, which is only three years ago? Well, selling conditions on passenger cars during the 1942 model year will approximate those two years as far as total volume is concerned. If curtailment of '42 model passenger car production is no more than 50 per cent, which OPM and OPACS have set as a likely over-all picture, then approximately 2,150,000 passenger cars will be turned out in the 12 months which began Aug. 1. Passenger car production in the calendar year 1934 was 2,177,919 units and in 1938 it was 2,000,985 units. The proposed 1942 model output also is bigger than for 1931, '32 or '33.

However, sales conditions are like-

is not to intimate that Mr. Ickes is thumbing rides, because he does not seem to be getting anywhere. Besides the government provides him with a car, on which he can paste his "I Use 1/3 Less Gas" sticker.

It is this sticker, among other things, that draws attention to his thumbs. As solver of the problems of

ly to be much better in the coming 12 months than in either 1934 or 1938. Both those were "depression" years, with sales restricted because of lower national income. In 1941-42 the national income is reaching an all-time peak, payrolls and wages are at record high levels and motor cars are much in demand. Only the shortage of vital raw materials is bringing about curtailment of automobile production. Of course, prices of cars will be 15 to 20 per cent higher, installment buying has been restricted and taxes will reduce the potential buyer's income. But still there is expected to be a substantial market for 2,150,000 passenger cars.

(Continued on page 60)

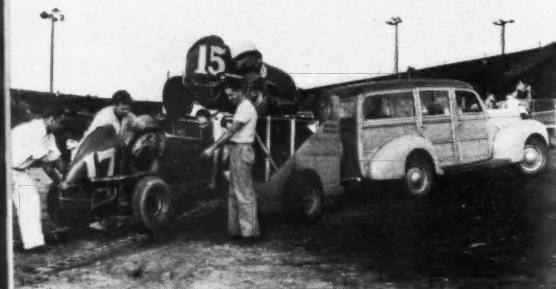
supplying the Eastern seaboard with gasoline, Mr. Ickes is all thumbs.

First off, when Mr. Ickes announced that an emergency existed, he ordered a 7 P. M. curfew on gasoline sales. Consumption rose. Oil men possibly could not have predicted the rise but they certainly could have told him that consumption would not fall. Then

MOCK UP. That's what engineers call this model of the radical new 12-cylinder plane engine developed by the Ford Motor Co. The V-12 engine is said to develop 1800 hp. at take-off. It has a cast instead of forged crankshaft, and is now undergoing extensive tests.

ICKES ONLY. Private gas pump on estate of the Petroleum Coordinator at Olney, Md. Capacity of tank is 500 gal.





NEWS

Mr. Ickes sought voluntary pledges from motorists to use a third less fuel. They did not take the hint and Mr. Ickes acted hurt. Then came as masterful a piece of bungling as a bureaucrat has ever produced, namely, lopping off 10 per cent of deliveries to retailers.

By this sidestep, Mr. Ickes probably seeks to duck all responsibility for the confusion, the inequities, and the abuses that will follow from such a scheme. It is rationing at its worst.

Any attempt by anyone outside the administration to determine the severity of the coming shortage is futile, because no one knows or cares to say how many tankers America is going to turn over to Britain, whose technique in this respect was apparently learned from Oliver Twist. So far, more than 60 American tankers have gone to Britain. What with one saving and another, such as overloading remaining tankers, opening new pipe lines, and using railroad tank cars, the capacity of a considerable number of

vessels has been offset. The projected pipe line from East Texas to New York will replace 65 tankers, and the oil industry expects to complete at least 12 new vessels of greatly increased capacity by the first of the year. Combined, these new facilities will more than make up for the inroads on America's tanker fleet. But they cannot keep pace with the present rate of transferring vessels to Britain and Russia, if the transfers are as numerous as we are led to believe.

We are denied facts on these transfers on the ground that they are military secrets, but some observers have been bold enough to assert no serious shortage exists in the East.

There is no disputing Mr. Ickes, because Washington can create a shortage at will by handing over more tankers to anti-Axis powers. Yet, if American motorists are expected to make the sacrifices they would readily make, they are entitled to facts. Then, if it is found that gasoline stocks in the East are inadequate, they are entitled to intelligent rationing, which will take the needs of drivers into account and proceed accordingly. It is not rationing for Mr. Ickes to toss the ball to the retailers and let them take the rap.

BREATH STOPPER. Ken Butler, one-legged member of "Suicide Legion," thrills crowd by soaring through an arch of flaming barrels.

MIDGET CONVOY. Duane Carter, a leading doodlebug racer, unloads his tiny cars from his special haul-away trailer.

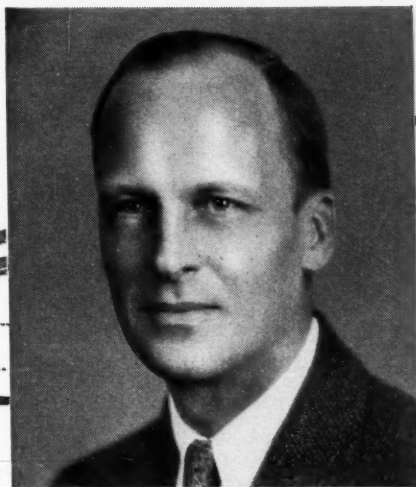
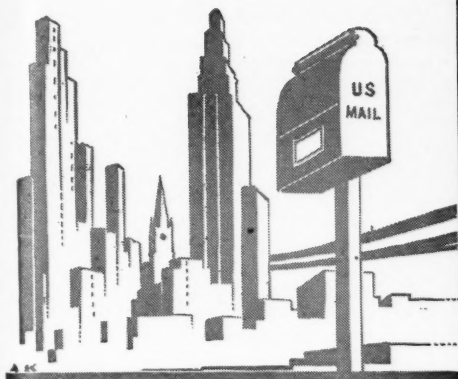
PAINT JOB. Unable to get silk hose, English girls have legs painted. Up to now body men have not been asked to help out.

DEALER DEFENSE

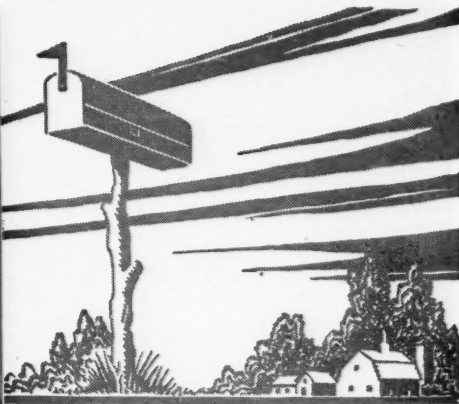
THE seriousness with which new-car dealers view the coming months is reflected in the wholehearted response of individual dealers

New Passenger Car Registrations

	JUNE	May	JUNE	SIX MONTHS		Per Cent Change, 6 Months, 1941 over 1940	Per Cent of Total Six Months		NINE MONTHS MODEL YEAR		
	1941	1941	1940	1941	1940		1941	1940	1941	1940	Per Cent Change
Chevrolet	103,324	121,411	78,951	596,477	457,575	+ 30.3	24.22	25.13	828,778	667,141	+ 24.2
Ford	71,586	76,854	50,492	382,542	296,032	+ 29.0	15.53	16.32	527,327	440,403	+ 19.7
Plymouth	54,601	66,290	45,635	304,772	240,340	+ 27.0	12.37	13.25	421,385	314,915	+ 33.8
Buick	37,569	42,311	24,119	209,915	144,427	+ 45.4	8.52	7.96	298,928	222,541	+ 34.3
Pontiac	33,168	39,889	22,341	194,944	119,564	+ 63.2	7.91	6.59	266,519	178,580	+ 49.2
Oldsmobile	27,332	33,551	18,223	159,488	103,474	+ 54.0	6.47	5.71	219,745	156,986	+ 39.9
Dodge	24,566	29,948	19,413	136,884	113,027	+ 21.0	5.56	6.24	180,542	147,166	+ 22.7
Chrysler	17,531	21,607	9,477	95,103	54,168	+ 75.5	3.86	2.98	122,705	70,237	+ 74.7
Studebaker	13,968	14,315	10,172	67,005	52,881	+ 27.0	2.72	2.91	93,923	80,055	+ 17.3
De Soto	11,254	13,611	6,910	57,746	37,806	+ 53.0	2.34	2.08	75,665	49,674	+ 52.3
Nash	10,228	11,265	4,719	54,033	29,051	+ 86.2	2.19	1.62	67,158	43,721	+ 53.6
Mercury	10,045	10,807	7,405	52,718	44,457	+ 19.0	2.15	2.45	72,314	66,475	+ 8.8
Hudson	8,232	9,963	7,361	45,831	41,351	+ 10.8	1.86	2.28	66,225	65,521	+ 1.1
Cadillac	7,105	8,110	2,933	39,226	18,001	+ 118.0	1.59	.99	53,105	29,267	+ 81.4
Packard	7,734	8,650	6,352	39,190	37,448	+ 4.9	1.59	2.08	57,734	59,162	- 2.4
Willys-American	2,637	3,074	1,827	13,250	11,207	+ 18.2	.55	.63	18,096	17,115	+ 5.7
Lincoln	2,292	2,426	1,522	11,783	10,903	+ 8.0	.49	.61	17,246	16,755	+ 2.9
Graham	40	54	218	461	624	- 26.0	.02	.04	992	937	+ 5.9
Crosley	108	68	16	327	244	+ 34.0	.01	.01	438	379	+ 15.6
Bantam		6	57	81	512	- 84.2		.03	180	744	- 75.8
Miscellaneous	150	268	472	1,287	1,722	- 25.4	.05	.09	2,433	2,329	+ 4.5
Total	443,470	514,478	318,615	2,463,063	1,814,814	+ 36.0	100.00	100.00	3,391,438	2,630,113	+ 28.9
Chrysler Corp.	107,952	131,456	81,435	594,505	445,341	+ 33.6	24.14	24.54	800,297	581,992	+ 37.5
Ford Motors	83,923	90,087	59,419	447,043	351,392	+ 27.2	18.15	19.36	616,887	523,633	+ 17.8
General Motors Corp.	208,498	245,272	146,567	1,200,050	843,041	+ 42.3	48.72	46.45	1,667,075	1,254,525	+ 32.9
All Others	43,097	47,663	31,194	221,465	175,040	+ 26.2	8.99	9.65	307,179	269,963	+ 13.8



Bill Toboldt, Editor, Motor Age



THE READERS'

CLEARING HOUSE

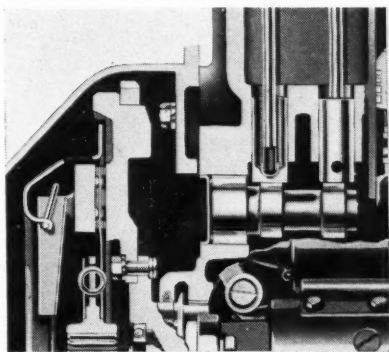
of Servicemen's Queries

OIL LEAK

One of my best customers has a 1940 Buick, Series 50, which has an oil leak in the rear of the engine somewhere, and the oil runs out of the clutch housing. I have checked the rear main bearing and, as far as I can see, the bearing fits perfectly. The engine uses oil at the rate of 1 qt. to 200 miles of driving, but I can't find how the oil gets out. I am sure there are no outside leaks, and yet the oil continues to come out of the clutch housing.

Can you tell me how the oil gets into the clutch housing if the rear mainbearing does not leak? Tennessee Subscriber.

IF the oil is running out of the clutch housing, and you are sure the rear main bearing fits properly so that the oil cannot leak there, then it is a safe bet that the oil is leaking from the expansion plug at the rear of the camshaft. A metal disk is used to close the rear of the camshaft rear bearing, and, if this disk does not fit tightly, the oil from the bearing will leak out and, of course, run down into the clutch housing.



In order to seal the edges of this disk, it will have to be removed, and, in removing, it is usually damaged so that a new one has to be installed. Seal the edges of this new disk before it is installed, using a hard-drying gasket cement. This will eliminate any further leaks at this point.

WHERE IS THE NOISE?

I am having trouble with a rear-end noise in late model Buick cars. This noise comes in between 41 and 50 m.p.h., and goes out above 50. I have done everything I know to do,

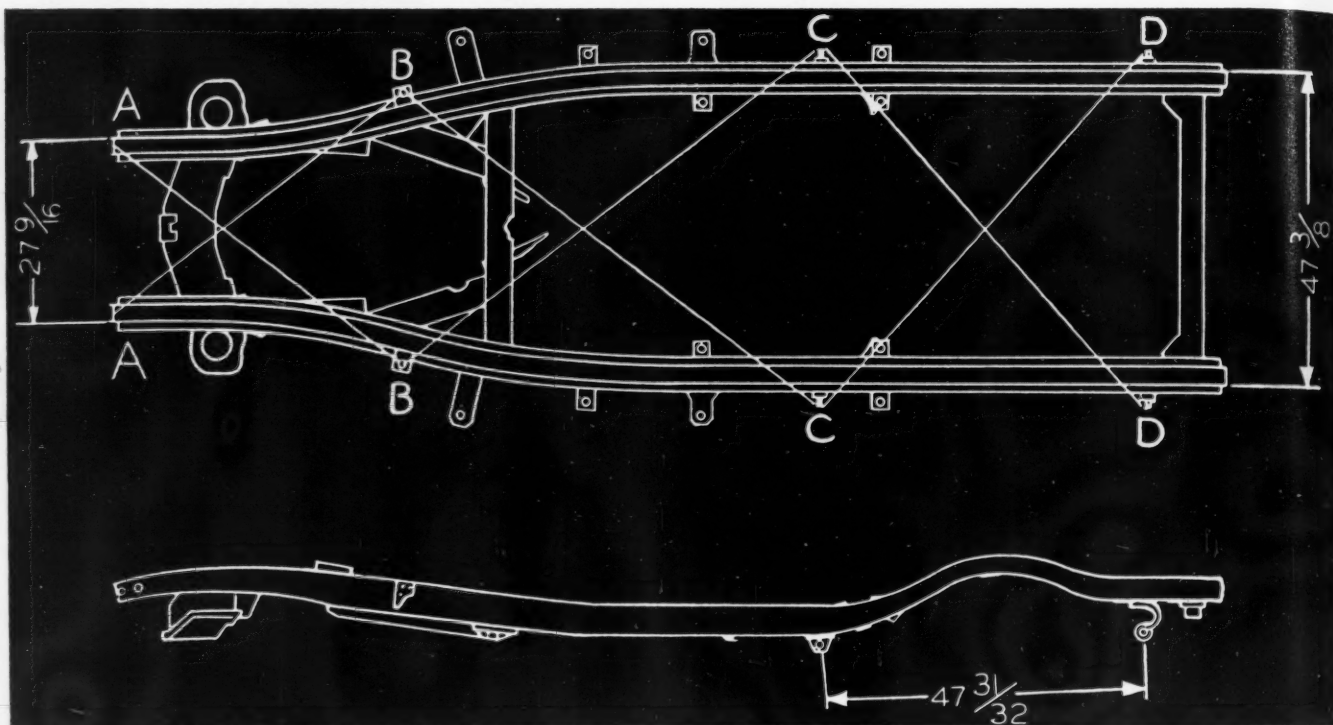
even to machining the ring gear carrier and replacing bearings, but I am unable to get this noise out. Changing to different grades of grease does not help.

This noise is not confined to just one car. I have several with the same complaint. Can you give me any suggestions? Chicago Subscriber.

APPARENTLY you have done a good job in trying to run down the cause of the noise you are experiencing, and, if you have done all this work carefully, I am wondering if the noise is actually in the rear end.

There is one test I would like to have you make and that is to run the engine with the car standing still, and run it slowly up through the speed range at which the rear end noise would appear. It may be that this condition is due to muffler noise, or power noise, rather than to the rear end itself and, if this is true, you can bring it in with the car standing still and slowly speeding the engine up through its range.

If you find the noise appears under these conditions, proving that it is power noise, you cannot eliminate the noise but you can change the speed



1941 Chevrolet Passenger Car Frame

range at which it appears by lengthening or shortening the muffler tail pipe.

I have seen cases in which, by cutting off about 2 in. of the muffler tail pipe, this power noise could be brought down from approximately 50 m.p.h. to about 40 m.p.h. On the other hand, if the owner drives consistently in the speed range from 40 to 50 m.p.h., you can move this noise up above that speed by adding a few inches to the length of the pipe.

By getting the noise out the speed range in which the owner drives, you will probably satisfy him, particularly when he knows exactly what is causing the noise and ceases to worry about it.

NOISY VALVE LIFTERS

I have just completed a valve and carbon job on a 1939 Lincoln-Zephyr. The job turned out fine except that the valve lifters are noisy, and I have been unable to quiet them. I am not very familiar with this type of lifter, and will appreciate any information you can give me as to the probable cause of this condition, and what I can do to correct the trouble. Kansas Subscriber.

SINCE your letter does not state whether you removed these lifters during the course of the work on the engine, it may be well to assume that you did, and give you what information I have to cover all conditions.

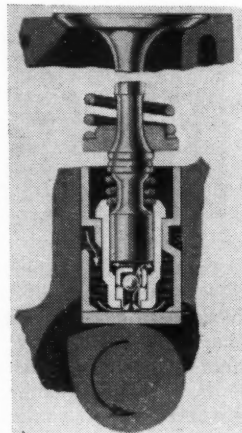
In the first place, before reinstalling the lifters, they should be washed free of oil, and dried with air pressure. Lifters will fill with oil much

quicker when the engine is started if they are installed entirely free of oil, since that condition permits the air to escape quickly.

Examine the plunger to see that it is a free fit in the cylinder and is not scored or pitted. Make sure that the ball check is free on its seat. Pull the plunger up to release the spring from the counterbore of the cylinder and raise the plunger in the cylinder as high as possible and still leave it guided properly in the cylinder. Then push the plunger down quickly and release. If the unit holds air to the extent that there is a tendency of the plunger to rise when released, the unit is operative provided the plunger has not been interchanged with that from another cylinder, which would affect the correct clearance between the plunger and the cylinder.

There should be .030 to .070 in. clearance between the valve stem and the top of the plunger, measured with no oil in the hydraulic unit and with the plunger and plunger spring fully compressed. A screw driver can be used for compressing the plunger to make this check.

If you did not remove the lifters



during the valve and carbon job, make the following checks to determine whether one or more of the lifters is faulty: Run the engine until the oil is at normal operating temperature. Remove the intake manifold.

With a bar-type lifter, lift the valve spring and stem and observe if the plunger in the hydraulic lifter follows the valve stem up, approximately 1/16 in. Then let the valve stem down on the plunger and observe if the plunger still stays up. If it does go down in less than 30 sec., this would indicate too much leak, either in the ball check or around the plunger. If the plunger fails to rise when the valve spring and stem is lifted, this would indicate that the plunger is seized in the cylinder. Under these conditions, the unit should be removed and cleaned, or replaced.

REMOVING STUCK HEADS

Can you tell me what to use to free up aluminum heads when they are stuck to the studs by corrosion? I have tried several products on the market that are supposed to free up these heads, but I have yet to find one that really does the job. New Haven Subscriber.

AS you mention, there are several products on the market that are said to serve this purpose, and I am surprised that you have been unable to locate one that will do the job.

Here is one that the boys tell me will do the trick when all else fails. I have not tried it myself so I can't vouch for it, but you might give it a try. It is citric acid, just a few drops

around the stud so it can run down between the stud and the head. The fellows claim that it will dissolve the form of aluminum oxide which coats the studs, and permit removing the head without further difficulty.

You can get a saturated solution of citric acid from your drug store. I would recommend that, as soon as the head is removed, you wipe off the studs so as to remove all trace of this acid.

WATER LOSS

Here's one that has me stopped.

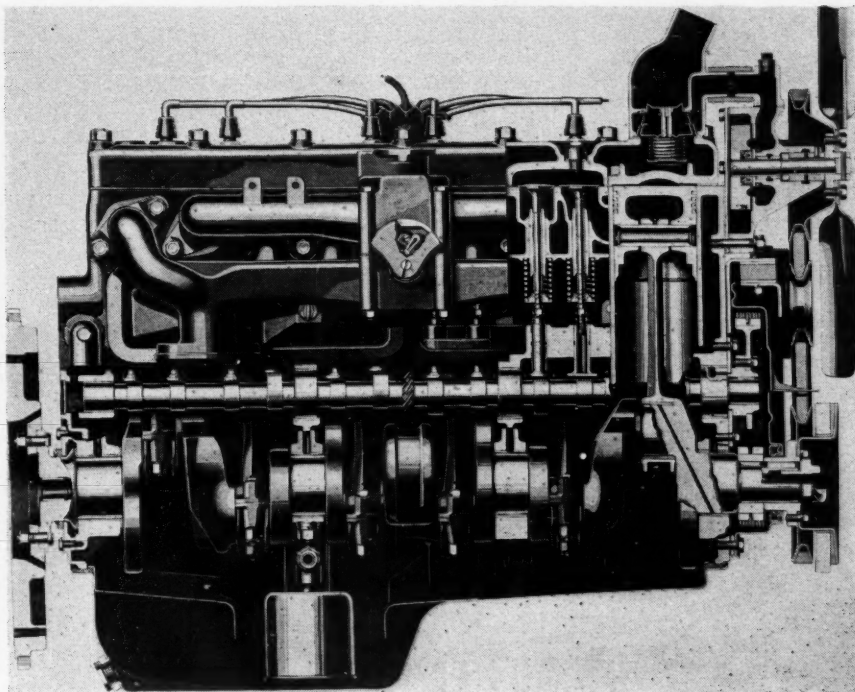
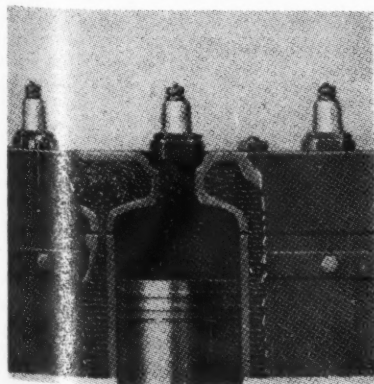
The car is a 1938 Oldsmobile Six, and the complaint is of losing water. The car will start out with the radiator full, and, by the time it has been driven 10 miles, will start to heat up. When you check the water in the radiator, the top tank is absolutely dry.

There are no external leaks, and no sign of water in the crankcase oil. Now where does the water go, and why and how can I stop it? The radiator has been cleaned out twice, so I am sure it has good circulation. Atlanta, Ga., Subscriber.

I FEEL sure the loss of the cooling system water is due to a pressure rise which forces the water out of the overflow tube. This pressure rise is probably due to a compression leak—which allows the pressure in the combustion chamber to leak out into the cooling system channels. This has the same effect as forcing air into the system, blowing the water out by the only path of escape provided—the overflow tube.

You can satisfy yourself that this is the cause by the following test: Disconnect the fan belt to render the water pump inoperative; disconnect the upper radiator hose at the radiator and hold it upright so it will act as a stand-pipe. Then run the engine at a rather high speed, and watch the water in the radiator hose. If bubbles appear, and the level of the water gradually rises in the hose, it is an indication that the trouble is caused by a leaking gasket.

When you replace the gasket, be sure to check the head on a surface plate to be sure it has a true surface, and then tighten the head with a tension wrench to prevent distortion.



TAPPING NOISE WHEN ENGINE IS COLD

One of my customers has a 1940 Model C-25 Chrysler that has a tapping noise in the engine when it is cold. This noise lasts 5 or 10 min., and then goes away.

It is impossible to bring this noise in when the engine is hot. I have heard the noise when the engine is first started, but by the time it is driven to the shop the noise has disappeared. The car has been driven 18,000 miles, and, because the noise sounds like a valve tappet, I did a valve and carbon job and examined the valves and guides carefully. The ends of the valve stems were slightly worn, so I refaced them, and installed new tappet screws. This did not correct the trouble.

I dropped the oil pan and checked all bearings without finding anything wrong. I even overhauled the oil pump and put in a new check valve, thinking that the noise might be located there. Still no luck.

Apparently the noise is not of a serious nature, but it is annoying, and the owner wants it corrected. Can you give me any suggestions as to where to look for this trouble, Dallas, Tex., Subscriber.

SINCE you have described this noise as sounding like a valve tappet noise, I am inclined to believe you will find it in the valve lifters. I have seen cases which acted exactly like the one you describe, and have found the trouble to be due to fine cracks in the surface of the lifter where it contacts the cam. In some cases, these cracks were so small they could hardly be seen with the naked eye, and had to be examined with a mag-

nifying glass. Apparently these cracks are just enough to permit the oil coating, which would ordinarily stay on the surface, to drain off so that, when the engine is first started, the surface of the lifter is perfectly dry. As soon as the oil starts circulating and reaches the lifter, the oil fills the cracks and coats the lifter, eliminating the noise.

If this is your trouble, it means that you will have to remove and carefully examine all lifters. Being of the mushroom type, they are removed from below. This means that you will have to remove the camshaft first in order to remove the lifters.

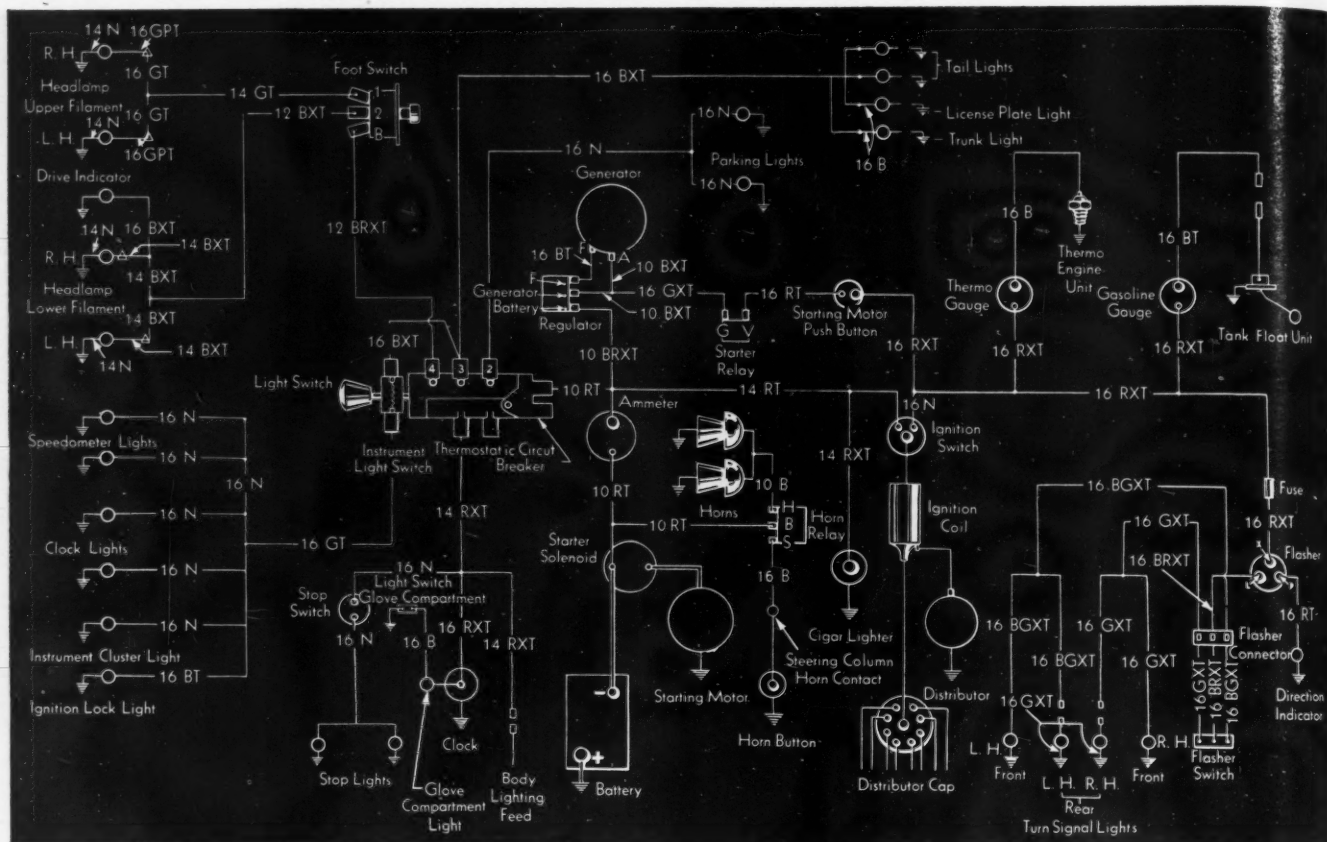
THE OLD "LIBERTY"

Please advise if you can give us any information on the valve timing and ignition timing from the flywheel markings for a Liberty engine. This engine is being used in a boat, and we are unable to find any information as to adjusting the timing. K. M. & S. Drew, Vergennes, Vt.

THE valve timing on this engine calls for the inlet valve to open 10 deg. after top center and to close 45 deg. after bottom center. The ignition timing, retarded, is set at 10 deg. after top center, with a fixed advance position of 30 deg. before top center.

AUTOMATIC CHOKE ADJUSTMENT

We have a 1937 LaSalle which we are having trouble with. The trouble is that, when the automatic choke spring container is turned far enough to start the car, the mixture runs too rich and the car gallops.



1941 Cadillac Wiring Diagram

We notice three threaded holes for attachment of the electrical current wire in the back of the metal choke box. Since there is only the one wire attached now, should there be other connections to the other two threaded screw holes on the back of this metal choke box? We'd appreciate your help. Pete Nissen, Afton, Iowa.

I THINK the difficulty you are experiencing with the choke on the 1937 LaSalle is the result of incorrect thermostat adjustment. The correct procedure for adjusting the thermostat is as follows:

1. Remove the thermostat case and bring the temperature of the thermostat spring to approximately 70 deg. F. At this temperature, the inside of the hook for the thermostat spring should coincide with the zero marking on the case. This step is very important, especially so in case a new thermostat or other new parts have been installed for any reason. One graduation of the thermostat case should be allowed for each 5 deg. variation in temperature if the setting is made at temperatures other than 70 deg. F.

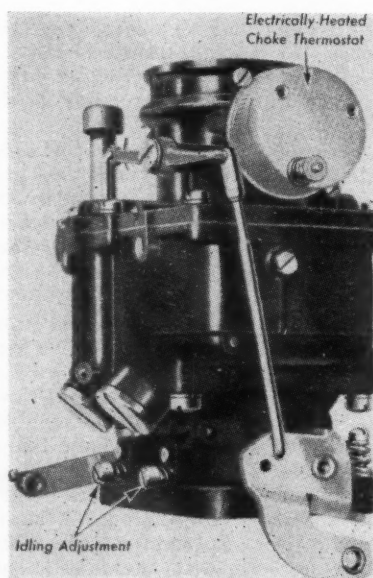
2. Install the thermostat case on the carburetor so that the hook for the thermostat spring comes in contact with the pin on the choke shaft lever without any tension when the choke valve is in the wide open position.

3. Check the zero location marking on the thermostat case which should

now coincide with the marking on the carburetor body.

4. Turn the thermostat case to the rich side from the zero marking on the case until the star stamped during the original setting by the factory is opposite the marking on the carburetor body. Then firmly tighten the retaining screws to hold the adjustment.

The three threaded holes you mention in your letter are not for attachment of any wire. The single wire is attached to the wire point only.



SLUGGISH WINDSHIELD WIPERS

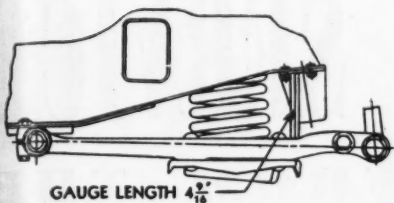
Don't overhaul those sluggish windshield wipers—particularly on the 1940 Chevrolet. Just crawl up under the cowl and stick a sharp pointed instrument through the two holes in the cover on the reversing side of the wiper motor. These are breather holes, but they are sometimes plugged by the gasket underneath the cover. Sticking a needle or some sharp pointed instrument through the gasket will relieve this condition and restore the wiper to its normal action. Raymond R. Crawford, 870 Summerlea Ave., Washington, Pa.

SPRING SAG

I have a 1936 Buick Series 40, and the left side of the car is slightly lower than the right. I am wondering if you can tell me how long the front springs should be so that I can check to determine whether the trouble is due to the left front spring having sagged, or whether the trouble is in the rear spring.

If the front spring has sagged, is there anything I can do about it other than buying a new spring? Richmond, Va., Subscriber.

YOU can make a gage for checking the height of the front springs by using a piece of wood or steel exactly



49/16 in. long Place this gage vertically on top of the lower control arm, and it should fit in between the two rivets holding the rubber bumper to the frame cross member, as shown in the illustration.

If both front springs are the same length within $\frac{1}{4}$ in., they are considered to be satisfactory, because the short spring can be built up by the addition of shims between the top of the spring and the spring seat in the frame cross member. These shims can be obtained from your Buick dealer under Part No. 1290141. Each shim is $\frac{1}{8}$ in. thick, and two of them should be enough to build up the low side. If more than two are needed, it is an indication that either the frame is sprung or the rear spring has sagged.

OIL LEAK AT DISTRIBUTOR

I have a 1939 Buick Model 48 that leaks oil through the holes in the upper part of the distributor, near the cap. It throws oil out at the rate of one quart to 150 miles of driving. The housing seems to fit tight in the head, and the shaft shows no wear in the housing.

A felt plug was placed in one of the holes (the upper one) near the lower end of the distributor shaft to prevent the oil from getting between the shaft and the housing and working its way to the top of the distributor, but this was of no help.

Why should this distributor leak oil in this way? There are only 15,000 miles on the car, and it has received good care during that time. Carl M. Johnson, Edgar, Wis.

THE trouble you are experiencing with the oil leak at the distributor of a 1939 Buick is undoubtedly caused by a clogged drain hole. I suggest that you remove the distributor and shaft and you will find the drain hole in the case. Cleaning the drain hole will permit the oil to drain back into the oil pan. There is a possibility that this drain hole has become either clogged by dirt or that it is obstructed by a cap screw on the other side of the case.

NO BRAKES

I recently installed relined brake shoes in the front wheels of a 1936 Ford, and since then I have had trouble in getting the brakes equalized between the front and rear. I made the adjustment in the usual manner at each wheel, but the front brakes do

not seem to be doing their share of the job. Can you tell me what I should do to get these brakes right? A New Mexico Subscriber.

PROBABLY the trouble with this job is that the brake rods should be taken up to compensate for wear in the wedge plate. I suggest that you follow the following procedure:

Disconnect the front brake rod from the operating lever by removing the clevis pin. Back off the upper brake adjusting screw until the wheel is free. Then adjust the brake rod clevis so that, when the operating lever is connected, there will be a

slight drag on the brakes. Be careful to see that the amount of drag is equal on both front wheels. Install the clevis pin and the cotter pin.

Next, turn the upper adjusting screw in until the wheel is just ready to lock; then back it off until the wheel is as free as it was with only the drag of the operating wedge.

It may seem to you that this is too tight, since the wheel will not spin freely, but will have a slight drag. But after driving a few miles and making the average number of brake applications, the high spots in the lining will wear down and the brakes will be O.K.

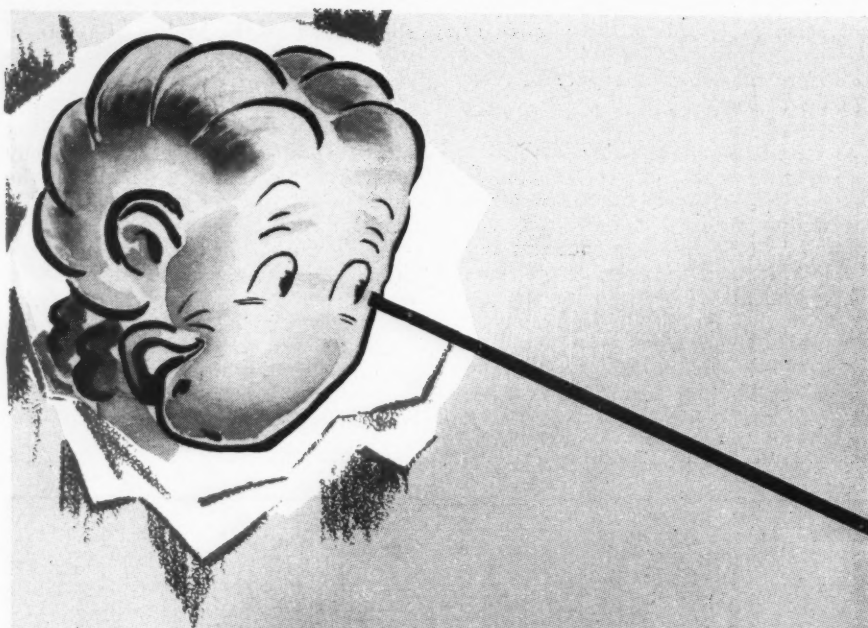
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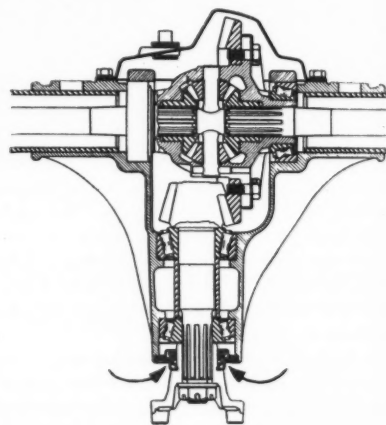
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Rear Axle Pinion Seal

If noise is encountered at the rear axle pinion oil seal on a 1941 Studebaker, all models, it can often be eliminated by applying a few drops of neat's-foot oil on the seal. If this does not eliminate the noise, the seal should be replaced with a new type, part No. 199379.



To make the installation, remove the cotter key, nut and flange, and pull out the old seal with a hooked instrument. When installing the new seal, be sure that it seats evenly all around the edge. Use a compressing collar and the hex nut from the pinion shaft to press the new seal in place.

Cleaning the Top

The fabric Cabriolet top used on the 1940 Chevrolet will over a period of time become dirty. This material is a washable fabric, and should be cleaned with soap and water only. A neutral soap, such as the Castiles, should be used. Do not use top dressing or other preparations to clean this material.

Hand Brake Cable

If difficulty is encountered with the 1941 Studebaker Commander and President models, due to the hand brake cable and conduit assembly twisting and looping out of position when the hand brake is pulled on forcefully, the conduit should be clipped to the left front fender apron. It is necessary to punch a hole in the

HINTS FACTORIES

fender apron at the point where the apron is pressed out to cover the rear upper control arm frame bracket. Use a small punch and make a hole about $\frac{1}{8}$ in. in diameter. Install a metal screw and a clip to hold the cable conduit.

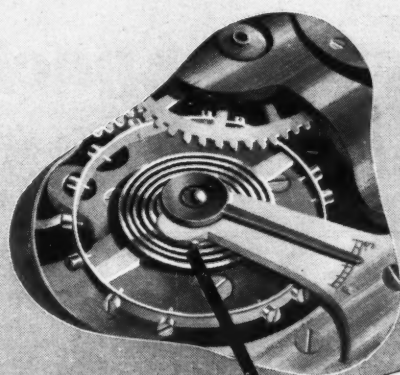
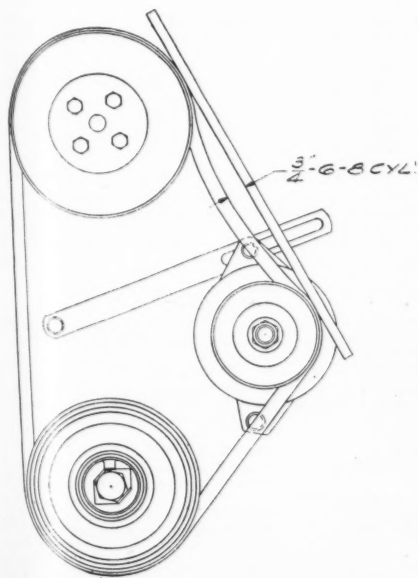
Muffler Installation

When installing a new muffler on a 1941 Pontiac, care should be taken to see that the small drain hole in the rear of the muffler is pointing toward the ground.

All these mufflers have this drain hole, designed to permit the condensed water vapor to drain out, and thereby retard corrosion. It is important, therefore, that the muffler be installed so that the rear end is slightly lower than the front, and the drain hole is toward the ground.

Water Pump Bearing Wear

Excessive wear of the water pump shaft bearing in the 1941 Oldsmobile may be traced to too much tension of the fan belt. The fan belt tension is adjusted by the movement of the generator, and should be set to give $\frac{1}{4}$ in. slack in the belt, measured as shown in the accompanying illustration.

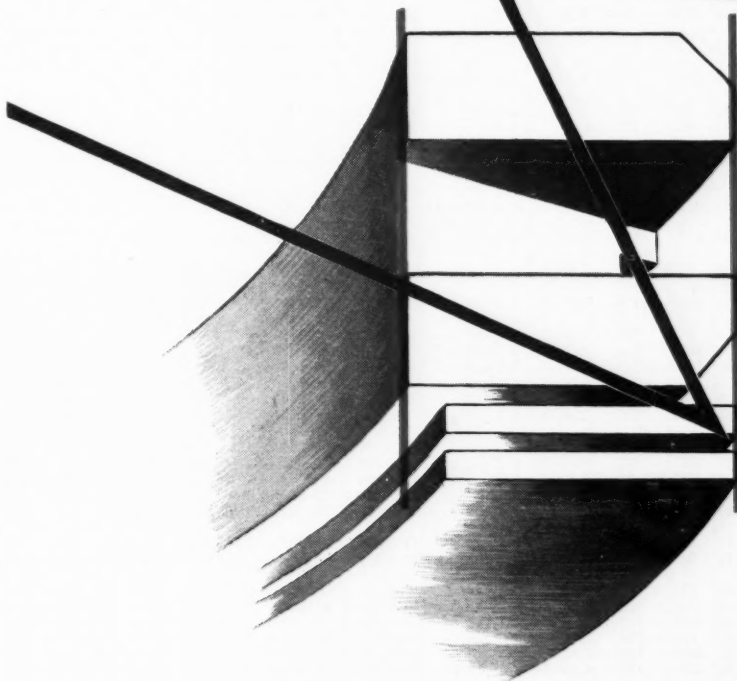


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Mechanical Specifications

These Specifications Are Brought Up-to-Date Each Month by the Car Manufacturers and Supersede All Others Previously Published

MAKE AND MODEL	Lowest priced 4-D. Sed. (Delvd.)	Wheelbase (In.)	Tire Size (In.)	No. of Cylinders, Bore and Stroke	ENGINE															CHASSIS				
					Taxable Hp.	Piston Displacement (Cu. In.)	Maximum Brake Hp. at Specified R.P.M.	Compression Ratio (to-1)	Displacement Factor †	Cylinder Head Material	Cams Shaft Drive Make	Piston Material	Oil Cleaner Make	Air Cleaner Make	Carburetor Make	Muffler Make	Electrical System Make	Battery Make	Clutch	Universal Joint Type and Make	Rear Axle Type and Make	Rear Axle Ratio	Front Spring Suspension	
																								Type and Make
Buick.....41-40A	1021	118	6.50/15	8-3 1/2 x 4 1/2	30.6	248.0	115-3500	6.50	36.9	CI	LB	AI	AC	AC	S-C	Hay	DR	DR	P-Obl	Mp-S-S	1 1/2	Own	4.10	IC
Buick.....41-40B	1052	121	6.50/16	8-3 1/2 x 4 1/2	30.6	248.0	115-3500	6.50	36.4	CI	LB	AI	AC	AC	S-C	Hay	DR	DR	P-Obl	Mp-S-S	1 1/2	Own	4.40	IC
Buick.....41-50	1185	121	6.50/16	8-3 1/2 x 4 1/2	30.6	248.0	125-3800	7.00	36.0	CI	LB	AI	AC	AC	S-C	Hay	DR	DR	P-Obl	Mp-S-S	1 1/2	Own	4.40	IC
Buick.....41-60	1288	126	7.00/15	8-3 1/2 x 4 1/2	37.8	320.2	165-3800	7.00	39.0	CI	LB	AI	AC	AC	S-C	Hay	DR	DR	P-Obl	Mp-S	1 1/2	Own	3.90	IC
Buick.....41-70	1364	126	7.00/15	8-3 1/2 x 4 1/2	37.8	320.2	165-3800	7.00	39.1	CI	LB	AI	AC	AC	S-C	Hay	DR	DR	P-Obl	Mp-S	1 1/2	Own	3.90	IC
Buick.....41-90	2155	139	7.50/16	8-3 1/2 x 4 1/2	37.8	320.2	165-3800	7.00	37.3	CI	LB	AI	AC	AC	S-C	Hay	DR	DR	P-Obl	Mp-S	1 1/2	Own	4.18	IC
Cadillac V8.....61,62,63,60S	1445	126	7.00/15	8-3 1/2 x 4 1/2	39.2	346.0	150-3400	7.25	(a)	CI	LB	AI	None	AC	S-C	Wal	DR	DR	P-Long	Nb-Mec	1 1/2	Own	3.77	IC
Cadillac V8.....67, 75	2595	139-136	7.50/16	8-3 1/2 x 4 1/2	39.2	346.0	150-3400	7.25	(b)	CI	LB	AI	None	AC	S-C	Wal	DR	DR	P-Long	Nb-Mec	1 1/2	Own	4.27	IC
Chevrolet M.D.L. & Sp.D.L.	795	116	6.00/16	6-3 1/2 x 3 3/4	29.4	216.5	90-3300	6.50	35.2	CI	Dia	CI	None	AC	Car	Var	DR	DR	P-Own	Nb-Own	1 1/2	Own	4.11	IC
Chrysler.....C-28	1091	121 1/2	6.25/16	6-3 1/2 x 4 1/2	27.3	241.5	112-3600	6.80	35.1	CI°	Mor	AI	Pur	AC	Car	NS	AL	Wil	P-B&B	rb	1 1/2	Own	3.90	IC
Chrysler.....C-30N, C-30K	1320	127 1/2	7.00/15	8-3 1/2 x 4 1/2	33.8	323.5	137-3400	6.80	41.5	CI°	M-W	AI	Pur	AC	Str	NS	AL	Wil	P-B&B	rb	1 1/2	Own	3.91	IC
Chrysler.....C-33	2595	145 1/2	7.50/15	8-3 1/2 x 4 1/2	33.8	323.5	140-3400	6.80	42.0	AI	M-W	AI	Pur	AC	Str	NS	AL	Wil	P-B&B	rb	1 1/2	Own	4.55	IC
Crosley.....CB-41	375	80	4.25/12	2-3x2 1/2	7.2	35.3	12-4000	5.60	.....	CI	Wau	CI	None	AC	Til	Own	AL	AL	P-Ro	Mp-S	1 1/2	Spi	5.14	C
De Soto-DeL. & Cust..S-8	1035	121 1/2	6.25/16	6-3 1/2 x 4 1/4	27.3	228.1	105-3600	6.80	35.5	CI°	Mor	AI	Pur	AC	Car	NS	AL	Wil	P-B&B	rb	1 1/2	Own	4.10	IC
Dodge-DeL. & Cust..D-19	954	119 1/2	6.00/16	6-3 1/2 x 4 3/8	25.3	217.8	91-3800	6.50	37.0	CI	Mor	AI	Pur	AC	Str	NS	AL	AL	P-B&B	bt	1 1/2	Own	4.30	IC
Ford-DeL. & Sup. DeL..85	755 1/2	114	6.00/16	8-3.062x3.75	30.0	221.0	85-3800	6.15	33.3	CI	Dia	CS	.....	.....	Own	Own	Own	Own	P-Long	Own	3/4	Own	3.78	Tr
Hudson-DeL. & Tr. 6.....10	811	116	(d)	6-3x4 1/2	21.6	175.0	92-4000	7.25	34.8	CI	Dia	AI	None	AC	Car	Old	AL	Na	P-Own	NB-Spi	1 1/2	Own	4.55	IC
Hud.-Sup. & Com. 6.....11, 12	952	121	(f)	6-3x5	21.6	212.0	102-4000	6.50	35.4	CI	Dia	AI	None	Un	Car	Old	AL	Na	P-Own	NB-Spi	1 1/2	Own	4.11	IC
Hudson-Com'dore 8.....14	1085	121	6.25/16	8-3x4 1/2	28.8	254.0	128-4200	6.50	39.6	CI	Dia	AI	None	Un	Car	Old	AL	Na	P-Own	NB-Spi	1 1/2	Own	4.11	IC
Hudson-Comm. Cus. 8.....17	1278	128	6.50/16	8-3x4 1/2	28.8	254.0	128-4200	6.50	37.8	CI	Dia	AI	None	Un	Car	Old	AL	Na	P-Own	NB-Spi	1 1/2	Own	4.11	IC
Lincoln-Zeph. & Cont. V-12	1450 1/2	125	7.00/16	12-2.875x3.75	39.6	292.0	120-3500	7.00	42.0	CI	Dia	CS	.....	.....	Own	Own	Own	Own	P-Long	Own	3/4	Own	4.44	Tr
Lincoln-Custom.....V-12	2550 1/2	138	7.00/16	12-2.875x3.75	39.6	292.0	120-3500	7.00	37.3	CI	Dia	CS	.....	.....	Own	Own	Own	Own	P-Long	Own	3/4	Own	4.44	Tr
Mercury.....95	960 1/2	118	6.50/16	8-3.187x3.75	32.5	239.0	95-3600	6.15	32.0	CI	Dia	CS	.....	.....	Own	Own	Own	Own	P-Long	Own	3/4	Own	3.54	Tr
Nash-Amb. 600.....4140	805	112	5.50/16	6-3 1/2 x 3 3/4	23.4	172.6	75-3600	6.87	33.4	CI	W-D	Als	None	AC	Car	Wal	DR	AL	P-B&B	m-Mec	1 1/2	Own	4.11	IC
Nash-Amb. 6.....4160	970	121	6.25/16	6-3 1/2 x 4 3/8	27.3	234.8	105-3400	6.30	35.6	CI	W-D	Als	Pur	AC	Car	Wal	AL	AL	P-B&B	m-Mec	1 1/2	Own	4.10	IC
Nash-Amb. 8.....4180	1091	121	6.50/16	8-3 1/2 x 4 1/2	31.2	260.8	115-3400	6.50	38.2	CI	W-D	Als	Pur	AC	Car	Wal	AL	AL	P-B&B	m-Mec	1 1/2	Own	4.10	IC
Oldsmobile.....Special 6	945	119	6.00/16	6-3 1/2 x 4 1/2	29.4	238.0	100-3400	6.20	37.7	CI	Whit	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	1 1/2	Own	4.10	IC
Oldsmobile.....Dynamic 6	1010	125	6.50/16	6-3 1/2 x 4 1/2	29.4	238.0	100-3400	6.20	37.2	CI	Whit	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	1 1/2	Own	4.30	IC
Oldsmobile.....Custom 6	1099	125	7.00/15	6-3 1/2 x 4 1/2	29.4	238.0	100-3400	6.20	37.0	CI	Whit	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	1 1/2	Own	4.30	IC
Oldsmobile.....Special 8	987	119	6.00/16	8-3 1/2 x 3 3/4	33.8	257.0	110-3600	6.30	38.4	CI	LB	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	1 1/2	Own	4.10	IC
Oldsmobile.....Dynamic 8	1045	125	6.50/16	8-3 1/2 x 3 3/4	33.8	257.0	110-3600	6.30	39.0	CI	LB	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	1 1/2	Own	4.30	IC
Oldsmobile.....Custom 8	1135	125	7.00/15	8-3 1/2 x 3 3/4	33.8	257.0	110-3600	6.30	39.0	CI	LB	AI	None	AC	Car	Var	DR	DR	P-B&B	m-Mec	1 1/2	Own	4.30	IC
Packard-110.....1900	1056	122	6.50/15	6-3 1/2 x 4 1/2	29.4	245.0	100-3600	6.39	.....	CI	Mor	Als	.....	AC	Str	.....	A-D	Wil	P-Long	UP	1 1/2	Own	4.30	IC
Packard-120.....1901	1261	127	7.00/15	8-3 1/2 x 4 1/2	33.8	282.0	120-3600	6.41	40.6	CI	Mor	Als	.....	AC	Car	Wal	AL	AL	P-Long	rb-Mec	1 1/2	Own	4.09	IC
Packard-160.....1903, 4, 5	1750	127-38-48	7.00/16	8-3 1/2 x 4 3/8	39.2	356.0	160-3600	6.45	43.8	CI	Mor	Als	Pur	AC	Str	.....	AL	AL	P-Long	rb-Mec	1 1/2	Own	(g)	IC
Packard-180.....1906, 7, 8	2587	127-38-48	7.00/16	8-3 1/2 x 4 3/8	39.2	356.0	160-3600	6.45	43.8	CI	Mor	Als	Pur	AC	Str	.....	AL	AL	P-Long	rb-Mec	1 1/2	Own	(g)	IC
Packard Clipper.....1951	1375	127	7.00/15	8-3 1/2 x 4 1/2	33.8	282.0	125-3600	6.85	38.5	CI	Mor	Als	.....	AC	Car	.....	AL	Wil	P-Long	rb-Mec	1 1/2	Own	4.69	IC
Plymouth.....P-11	800	117	6.00/16	6-3 1/2 x 4 3/8	23.4	201.3	87-3800	6.70	35.1	CI	Mor	AI	Pur	AC	Car	NS	AL	AL	P-B&B	bt	1 1/2	Own	4.10	IC
Plymouth-Spec. DeL.P-12	845	117	6.00/16	6-3 1/2 x 4 3/8	23.4	201.3	87-3800	6.70	36.1	CI°	Mor	AI	Pur	AC	Car	NS	AL	AL	P-B&B	bt	1 1/2	Own	4.30	IC
Pontiac-DeL. 6.....41-25	921	119	6.00/16	6-3 1/2 x 4	30.4	239.2	90-3200	6.50	37.9	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	1 1/2	Own	4.10	IC
Pontiac-Stream. 8.....41-26	980	122	6.50/16	6-3 1/2 x 4	30.4	239.2	90-3200	6.50	37.5	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	1 1/2	Own	4.30	IC
Pontiac-Custom 6.....41-24	1052	122	6.50/16	6-3 1/2 x 4	30.4	239.2	90-3200	6.50	37.5	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	1 1/2	Own	4.30	IC
Pontiac-DeL. 8.....41-27	946	119	6.00/16	8-3 1/2 x 3 3/4	33.8	248.9	103-3500	6.50	38.9	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	1 1/2	Own	4.10	IC
Pontiac-Stream. 8.....41-28	1005	122	6.50/16	8-3 1/2 x 3 3/4	33.8	248.9	103-3500	6.50	38.5	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	1 1/2	Own	4.30	IC
Pontiac-Custom 8.....41-29	1077	122	6.50/16	8-3 1/2 x 3 3/4	33.8	248.9	103-3500	6.50	38.5	CI	Mor	CN	Own	AC	Car	Var	DR	DR	P-Inl	rb-SM	1 1/2	Own	4.30	IC
Studebaker-Champ. 6. 3G	770	110	5.50/16	6-3x4	21.6	169.6	80-4000	6.50	39.2	CI	Dia	AI	None	AC	Car	Wal	AL	Wil	P-B&B	NB-Spi	1 1/2	Spi	4.56	IT
Studebaker-Com. 6.....11A	985	119	6.25/16	6-3 1/2 x 4 3/8	26.3	226.2	94-3600	6.50	40.2	CI	Dia	AI	Fram	AC	Str	Wal	AL	Wil	P-B&B	NB-Spi	1 1/2	Spi	4.55	IT
Studebaker-Pres. 8.....7C	1115	124 1/2	7.00/16	8-3 1/2 x 4 1/2	30.0	250.4	117-4000	6.50	39.0	CI	Dia	AI	Fram	AC	Str	Wal	AL	Wil	P-Inl	NB-Spi	1 1/2	Spi	4.55	IT
Willys-Amercar.....441	705	104	5.50/16	4-3 1/2 x 4 3/8	15.6	134.2	63-3900	6.48	30.8	CI	LB	AI	None	AC	Car	Mc	AL	AL	P-At	m-UP	1 1/2	Own	4.44	1 1/2 E

ABBREVIATIONS:

1/2 - Semi-floating
3/4 - Three-quarter floating
1/2-E - Semi-elliptic

° - Aluminum optional

† - Computed on basis of engine displacement, rear axle ratio, effective tire diameter and shipping weight plus 500 lbs.

‡ - Exclusive of Federal taxes.

(a) - 40.3 on Model 67

(b) - 38.4 on Model 67

(d) - De Luxe, 6.00/16; Traveler, 5.50/16

(f) - Model 11 - 6.00/16; Model 12 - 6.25/16

(g) - Models 1903-6, 3.92; Models 1904-7, 4.09; Models 1905-8, 4.36

A-D - Electric Auto-Lite Co. and Delco-Remy Division

AC - AC Spark Plug Co.

Al - Aluminum

AL - Electric Auto-Lite Co.

Als - Aluminum with struts

At - Atwood

B&B - Borg & Beck Division

bt - Ball and trunnion type

C - Conventional

Car - Carter Carburetor Corp.

CC - Conventional coil

CI - Cast iron

CN - Chrome nickel

CS - Cast steel

Dia - Continental Diamond Fibre Co.

DR - Delco-Remy Division

Hay - Hayes Industries, Inc.

IC - Independent

Tune-Up Specifications

These Specifications Are Brought Up-to-Date Each Month by the
Car Manufacturers and Supersede All Others Previously Published

MAKE AND MODEL	Compression Pressure at Cranking Speed (Lbs.)	Spark Plugs Make and Type	RINGS		VALVES						IGNITION						Rods Removed From	FRONT AXLE								
			No. and Width Compression	No. and Width Oil	Inlet Seat Angle (Degrees)	Exhaust Seat Angle (Degrees)	Stem Diameter (Ins.)	Operating Tappet Clearance		Inlet Valve Opens Before or After T. C.	Inlet Tappet Clearance for Valve Timing	No. of Degrees	No. of Flywheel Teeth	Breaker Points Gap (Ins.)	Cam Angles (Degrees)	Spark Plug Gap (Ins.)		Spark Occurs °TC	No. of Flyw. Teeth Spark Occurs TC	Timing Marks Located	Capacity Crankcase (Qts.) Dry	Capacity Cooling System	Caster (Degrees)	Camber (Degrees)	Toe-in (Inches)	King Pin Inclination (Degrees)
								Inlet	Exhaust																	
Buick.....41-40A	142x	AC-46	2-3/32	2-1/16	45	45	.372	.015H	.015H	++	13B	5 1/4B	.015	31	.025	2B	3/4B	Fly	A	8	13	3/4 ± 3/8	N 1/4 ± 1/8	0-1/8	4 1/8	
Buick.....41-40B	142x	AC-46	2-3/32	2-1/16	45	45	.372	.015H	.015H	++	13B	5 1/4B	.015	31	.025	2B	3/4B	Fly	A	8	13	3/4 ± 3/8	N 1/4 ± 1/8	0-1/8	4 1/8	
Buick.....41-50	148x	AC-46	2-3/32	2-1/16	45	45	.372	.015H	.015H	++	13B	5 1/4B	.015	31	.025	4B	1 1/2B	Fly	A	8	13	3/4 ± 3/8	N 1/4 ± 1/8	0-1/8	4 1/8	
Buick.....41-60	151x	AC-46	2-3/32	2-1/16	45	45	.372	.015H	.015H	++	14B	6B	.015	31	.025	6B	2 1/2B	Fly	A	10	16 3/4	3/4 ± 3/8	N 1/4 ± 1/8	0-1/8	4 1/8	
Buick.....41-70	151x	AC-46	2-3/32	2-1/16	45	45	.372	.015H	.015H	++	14B	6B	.015	31	.025	6B	2 1/2B	Fly	A	10	16 3/4	3/4 ± 3/8	N 1/4 ± 1/8	0-1/8	4 1/8	
Buick.....41-90	151x	AC-46	2-3/32	2-1/16	45	45	.372	.015H	.015H	++	14B	6B	.015	31	.025	6B	2 1/2B	Fly	A	10	18	3/4 ± 3/8	N 1/4 ± 1/8	0-1/8	5 3/8	
Cadillac V8.....61,62,63,60S	182x	AC-104	2-(c)	2-5/8	45	45	.341	AA	AA	AA	TC	TC	.0125	31	.025	5B	2B	TD	A	7	25	-1 1/2 - N2 1/2	-3/4 ± 3/8	1 1/2 ± 3/8	5°-51'	
Cadillac V8.....67,75	182x	AC-134	2-(c)	2-5/8	45	45	.341	AA	AA	AA	TC	TC	.0125	31	.025	5B	2B	TD	A	7	25	-1 1/2 - N2 1/2	-3/4 ± 3/8	1 1/2 ± 3/8	5°-51'	
Chevrolet Sp.DL & M.DL.....	AC-104		2-1/2	1-1/8	30	30	.340	.006H	.013H		.006	3B	1B	.018	39	.040	5B	2B	Fly	A	5 1/2	14	0-1 1/2	N 1/4 ± 1/2	0-1/8	4°-45'
Chrysler.....C-28	145x	AL-A7	2-1/8	2-5/8	45	45	.340	.008H	.010H	.014	12B	4 3/4B	.020	34 1/2-38	.025	TC	TC	VD	A	5	18	N1-1	0-1 3/4	0-1/8	4 3/4-6	
Chrysler.....C-30N, C-30K	155x	AL-A7	2-1/8	2-5/8	45	45	.340	.008H	.010H	.011	6B	2 1/2B	.018	27-30 1/2	.025	TC	TC	VD	A	6	24	N1-1	0-1 3/4	0-1/8	4 3/4-6	
Chrysler.....C-33	155x	AL-AL7	2-1/8	2-5/8	45	45	.340	.008H	.010H	.011	6B	2 1/2B	.018	27-30 1/2	.025	3B	1B	VD	A	6	24	N1-1	0-1 3/4	0-1/8	4 3/4-6	
Crosley.....CB-41	80	AL-A5	2-1/8	1-3/8	45	45	.311	.007C	.009C		20B	5B	.020	46	.025	TC	TC	Fly	A	3		6 1/2-11	2	1/8	6 1/2	
De Soto-DeL. & Cust. S-8	150x	AL-A7	2-1/8	2-5/8	45	45	.340	.008H	.010H	.014	12B	2 1/2B	.020	34 1/2-38	.025	TC	TC	VD	A	5	18	N1-1	0-1 3/4	0-1/8	4 3/4-6	
Dodge-DeL. & Cust. D-19	145x	AL-A7	2-(c)	2-5/8	45	45	.340	.008H	.010H	.014	9B	3 1/2B	.020	34 1/2-38	.025	TC	TC	VD	A	5	15	N1-1	0-1 3/4	0-1/8	4 3/4-6	
Ford-DeL. & Sup. DeL. 85	100	Ch-H10	2-(b)	1-(f)	45	45	(k)	.011C	.011C		TC	TC	.015		.025	4B	1 1/4B	Dist	A	5	23 3/4	4 1/2-9	1/4-1	1/8	8	
Hudson-DeL. & Tr. 6.....10	125x	Ch-J9	2-3/32	2-(d)	45	45	.341	.010H	.012H	.010	27 1/2B	4B	.020	34	.032	1 1/2B	2 1/2B	Fly	A	6	13	0-1 1/4	1/2 ± 1/4	1/2 ± 1/4	3°-36'	
Hudson-Sup. & Com. 6.....11,12	120x	Ch-J9	2-3/32	2-(d)	45	45	.341	.008H	.008H	.006	10 3/8B	4B	.020	34	.032	1 1/2B	2 1/2B	Fly	A	6	13	0-1 1/4	1/2 ± 1/4	1/2 ± 1/4	3°-36'	
Hudson-Com'dore 8.....14	119x	Ch-J9	2-3/32	2-(d)	45	45	.343	.006H	.008H	.006	10 3/8B	4B	.017	30 1/2	.032	TC	TC	Fly	A	9	18	0-1 1/4	1/2 ± 1/4	1/2 ± 1/4	3°-36'	
Hudson-Comm. Cus. 8.....17	119x	Ch-J9	2-3/32	2-(d)	45	45	.343	.006H	.008H	.006	10 3/8B	4B	.017	30 1/2	.032	TC	TC	Fly	A	9	18	0-1 1/4	1/2 ± 1/4	1/2 ± 1/4	3°-36'	
Lincoln-Zeph. & Cont. V-12.....	Ch-H10		2-(g)	1-(h)	45	45	.311	.013C	.013C		10 3/8B	3 1/4B	.015		.029	4B	1 1/4B	Dist	A	5	22	3-5	1/4-3/4	1/8	3 3/4-4 3/4	
Lincoln-Custom.....V-12.....	Ch-H10		2-(g)	1-(h)	45	45	.311	.013C	.013C		10 3/8B	3 1/4B	.015		.029	4B	1 1/4B	Dist	A	5	22	3-5	1/4-3/4	1/8	3 3/4-4 3/4	
Mercury.....95	100	Ch-H10	2-(b)	1-(f)	45	45	(k)	.011C	.011C		TC	TC	.015		.025	4B	1 1/4B	Dist	A	5	23 3/4	4 1/2-9	1/4-1	1/8	8	
Nash-Amb. 600.....4140	120	AL-AN7	2-3/32	1-3/8	45	45	.341	.015	.015	.019	19B	6 1/2B	.020	35	.025	TC	TC	VD	A	5	14	0 to ± 1/4	0-1 1/2	0-1/8	5 1/2	
Nash-Amb. 6.....4160	125	AC-45	2-3/32	2-5/8	45	45	.372	.015	.015	.015	12AT	3 1/2A	.020	35	.025	5B	1 1/2AT	VD	A	6	17	0-N 1/2	1/4-3/4	1/8 ± 3/8	4 3/4	
Nash-Amb. 8.....4180	110	AC-45	2-3/32	2-(e)	45	45	.372	.015	.015	.015	16AT	5A	.017	28	.025	9B	2 1/2AT	VD	A	7	16	0-N 1/2	1/4-3/4	1/8 ± 3/8	4 3/4	
Oldsmobile.....Special 6	115	AC-44	2-3/32	2-3/8	30	45	.342	.008H	.011H	.012	5B	2B	.020	35	.040	TC	TC	Fly	A	5	18	0-N 3/4	N 1/4-3/4	1/8-1/8	4°51' 6"	
Oldsmobile.....Dynamic 6	115	AC-44	2-3/32	2-3/8	30	45	.342	.008H	.011H	.012	5B	2B	.020	35	.040	TC	TC	Fly	A	5	18	0-N 3/4	N 1/4-3/4	1/8-1/8	4°51' 6"	
Oldsmobile.....Custom 8	115	AC-44	2-3/32	2-3/8	30	45	.342	.008H	.011H	.012	5B	2B	.020	35	.040	TC	TC	Fly	A	5	18	0-N 3/4	N 1/4-3/4	1/8-1/8	4°51' 6"	
Oldsmobile.....Special 8	107	AC-44	2-3/32	2-3/8	30	45	.342	.008H	.011H	.012	TC	TC	.015	31	.030	2B	3/4B	Fly	A	6	22	0-N 3/4	N 1/4-3/4	1/8-1/8	4°51' 6"	
Oldsmobile.....Dynamic 8	107	AC-44	2-3/32	2-3/8	30	45	.342	.008H	.011H	.012	TC	TC	.015	31	.030	2B	3/4B	Fly	A	6	22	0-N 3/4	N 1/4-3/4	1/8-1/8	4°51' 6"	
Oldsmobile.....Custom 8	107	AC-44	2-3/32	2-3/8	30	45	.342	.008H	.011H	.012	TC	TC	.015	31	.030	2B	3/4B	Fly	A	6	22	0-N 3/4	N 1/4-3/4	1/8-1/8	4°51' 6"	
Packard-110.....1900	(a)		2-(m)	1-3/8	30	45	.339	.007H	.010H	.012	1B	1 1/2B	.020	35	.028	6B	2 1/2B	VD	A	5	15	1/2 ± 1/2	1/2 ± 1/2	0-1 1/8	0 2 1/2	
Packard-120.....1901	(a)		2-(n)	1-3/8	30	45	.339	.007H	.010H	.012	1B	1 1/2B	.015	27	.028	7B	2 1/2B	VD	A	6	17	1/2 ± 1/2	1/2 ± 1/2	0-1 1/8	0 2 1/2	
Packard-160.....1903, 4, 5	(a)		2-(m)	1-3/8	30	45	.339	aa	aa	aa	4B	1 1/2B	.015	27	.028	5B	2B	VD	A	7	20	N 3/4 ± 1/2	1/2 ± 1/2	0-1 1/8	0 2 1/2	
Packard-180.....1906, 7, 8	(a)		2-(m)	1-3/8	30	45	.339	aa	aa	aa	4B	1 1/2B	.015	27	.028	5B	2B	VD	A	7	20	N 3/4 ± 1/2	1/2 ± 1/2	0-1 1/8	0 2 1/2	
Packard.....1951	(a)		2-(n)	1-3/8	33	45	.339	.007H	.010H	.012	1B	1 1/2B	.015		.028	5B	2B		A	6	17	N 1 ± 1/2	1/4 ± 1/2	0-1 1/8	0 5°35'	
Plymouth.....P-11	150x	AL-A7	2-(c)	2-5/8	45	45	.340	.008H	.010H	.014	9B	3 1/2B	.020	34 1/2-38	.025	TC	TC	VD	A	5	14	N1-1	0-3/4	0-1/8	4 3/4-6	
Plymouth-Spec. DeL.P-12	150x	AL-A7	2-(c)	2-5/8	45	45	.340	.008H	.010H	.014	9B	3 1/2B	.020	34 1/2-38	.025	TC	TC	VD	A	5	14	N1-1	0-3/4	0-1/8	4 3/4-6	
Pontiac-DeL. 6.....41-25	155x	AC-45	2-3/32	1-3/8	30	45	.312	.012H	.012H	.015	5B	2B	.020	37	.025	4B	1 1/2B	Fly	A	6	18	N 1/2-N1	0	0-1/8	4 3/8	
Pontiac-Stream. 6.....41-26	155x	AC-45	2-3/32	1-3/8	30	45	.312	.012H	.012H	.015	5B	2B	.020	37	.025	4B	1 1/2B	Fly	A	6	18	N 1/2-N1	0	0-1/8	4 3/8	
Pontiac-Custom 6.....41-24	155x	AC-45	2-3/32	1-3/8	30	45	.312	.012H	.012H	.015	5B	2B	.020	37	.025	4B	1 1/2B	Fly	A	6	18	N 1/2-N1	0	0-1/8	4 3/8	
Pontiac-DeL. 8.....41-27	155x	AC-45	2-3/32	1-3/8	30	45	.312	.012H	.012H	.015	5B	2B	.015	31	.025	4B	1 1/2B	Fly	A	6	19 1/2	N 1/2-N1	0	0-1/8	4 3/8	
Pontiac-Stream. 8.....41-28	155x	AC-45	2-3/32	1-3/8	30	45	.312	.012H	.012H	.015	5B	2B	.015	31	.025	4B	1 1/2B	Fly	A	6	19 1/2	N 1/2-N1	0	0-1/8	4 3/8	
Pontiac-Custom 8.....41-29	155x	AC-45	2-3/32	1-3/8	30	45	.312	.012H	.012H	.015	5B	2B	.015	31	.025	4B	1 1/2B	Fly	A	6	19 1/2	N 1/2-N1	0	0-1/8	4 3/8	
Studebaker-Champ. 6.....3G	105	Ch-J8	2-(c)	1-5/8	45	45	.312	.016C	.016C	.020	15B	5B	.020	35	.025	2B	1 1/2B	Fly	A	5	10 1/2	1-2	1/2	1/8-7/8	5 1/2	
Studebaker-Com. 6.....11A	105	Ch-8	2-3/8	1-3/8	45	45	.343	.016C	.016C	.020	15B	5 1/2B	.020	35	.025	2B	3/4B	VD	A	6	13	N 1 ± 1/2	1/2	1/8-7/8	5 1/2	

ABBREVIATIONS:

11—With valve .004 in. off seat, the clearance is .015 inches
(x)—At 1000
(a)—AC-103; Champion Y-4
(b)—.0915 to .0920 in.</

Motor Car Price, Weight and Body Table

Following are delivered prices at factory for cars with standard equipment and include all federal taxes with exception of Ford, Lincoln-Zephyr, Mercury and Willys. Optional equipment, state or local taxes, transportation charges and finance charges are extra.

BODY, MAKE AND MODEL	Delivered Price	Shipping Weight	BODY, MAKE AND MODEL	Delivered Price	Shipping Weight	BODY, MAKE AND MODEL	Delivered Price	Shipping Weight	BODY, MAKE AND MODEL	Delivered Price	Shipping Weight	BODY, MAKE AND MODEL	Delivered Price	Shipping Weight	BODY, MAKE AND MODEL	Delivered Price	Shipping Weight
BUICK			CHEVROLET			DODGE			Custom			OLDSMOBILE			PONTIAC		
Special 41-40	1052	3730	Master DeL.	712	3020	DeLuxe	862	3034	Coupe.....	1465	3560	(Continued)			DeLuxe Six		
Tour. Sedan, 4d.	1134	3790	Bus. Coupe.....	743	3025	Coupe.....	915	3109	Sedan.....	1545	3710	Custom Eight			Conv. Sed. Cpe.	1023	3335
Tr. Sed., SE., 4d.	935	3630	Coupe, 5p.....	754	3050	Sedan, 2d., 6p...	954	3149	Club Coupe....	1545	3640	Club Coupe, 3-6p	1079	3430	Met. Sed., 4d, 6w	921	3230
Bus. Coupe.....	1006	3700	Sport Sedan, 5p.	795	3090	Sedan, 4d., 6p...						Sedan, 4d, 6p...	1135	3500			
Sedanet, 2d.	1063	3690										Conv. Cpe., 3-6p	1227	3620			
Estate Wagon...	1463	3980															
			Special DeL.			Custom			LINCOLN-CONTINENTAL			PACKARD			Streamliner		
De Luxe			Bus. Coupe.....	769	3040	Broug., 2d., 6p.	962	3169	Cabriolet, 6p...	2700	3860	One Ten			Six		
Special 41-40	1096	3730	Coupe, 5p.....	800	3050	Club Coupe, 6p..	995	3154	Coupe, 6p.....	2650	3890	Bus. Coupe, 2p..	907	3150	Sedan Coupe....	923	3305
Tour. Sedan, 4d.	1178	3790	Town Sedan, 5p.	810	3095	Sedan, 4d., 6p..	1062	3199				Club Cpe., 2-4p.	1000	3200	Sedan, 4d.....	980	3385
Tr. Sed., SE., 4d.	979	3630	Sport Sedan, 5p.	851	3125	Town Sedan, 6p.	1195	3579				Tr. Sed., 2d., 5p.	1024	3245	Sup. Sed. Cpe..	969	3320
Bus. Coupe.....	1050	3700	Cabriolet, 5p...	949	3285	Sedan, 7p.....	1282	3669				D. Cb. Cpe., 2-4p.	1038	3205	Sup. Sed., 4d...	1026	3400
Sedanet, 2d.	1107	3690	Stat. Wagon, 8p.	995		Limousine, 7p..	1162	3384	LINCOLN-CUSTOM			Tr. Sed., 4d., 5p.	1056	3250			
Estate Wagon...	1470	3913				Conv. Coupe....			Sedan, 8p.....	2550	4250	D. T. Sed., 2d., 5p.	1084	3270	Custom Six		
			CHRYSLER						Limousine, 8p...	2675	4270	D. T. Sed., 4d., 5p.	1116	3270	Sedan Coupe....	995	3260
Special 40 (A)			Royal			FORD						Conv. Cpe., 2-4p.	1175	3310	Sedan, 4d.....	1052	3355
Bus Coupe.....	915	3530	Coupe, 3p.....	995	3170	Special	680	2878				D. C. Cpe., 2-4p.	1209	3315	Sta. Wag.	1175	3650
Sport Coupe....	980	3590	Brougham, 6p..	1066	3270	Bus. Coupe.....	715	2983	MERCURY			Stat. Wag., 8p..	1231	3460	Sta. Wag. DeL..	1225	3665
Sedan, 4d.....	1021	3670	Sedan, 4d., 6p..	1091	3300	Tudor Sedan....	755	3033	Coupe, w.f.s....	885	3008	D. Sta. Wag., 8p	1306	3470			
Conv. Coupe....	1138	3780	Sedan, 4d., 6p..	1136	3320	Fordor Sedan...			Coupe, f.s....	910	3049				TeL. Eight		
			Town Sedan, 6p.	1085	3260	DeLuxe-85			Sedan, 2d.....	920	3184	One Twenty			Coupe.....	853	3220
DeLuxe			Sedan, 7p.....	1345	3650	Coupe, w.f.s....	710	2953	Town Sedan....	960	3221	Bus. Cpe., 2p..	1112	3385	Sedan Coupe....	889	3250
Special 40 (A)			Limousine, 7p..	1415		Tudor Sedan....	740	2981	Sedan Coupe....	950	3118	Tr. Sed., 2d., 5p.	1230	3504	Sedan, 2d.....	899	3250
Bus. Coupe.....	959					Fordor Sedan...	750	3095	Club, Conv....	1070	3222	Tr. Sed., 4d., 5p.	1261	3510	Conv. Sed. Cpe.	946	3285
Sport Coupe....	1024		Windsor			Station Wagon..	935	3412	Station Wagon..	1110	3468	Conv. Cpe., 2-4p.	1377	3585	Met. Sed., 4d, 6w	946	3295
Sedan, 4d.....	1065		Coupe, 3p.....	1045	3170							D. Sta. Wag., 8p	1436	3720			
Conv. Coupe....	1182		Sedan, 2d., 6p.	1128	3270	Super						Stat. Wag., 8p..	1511	3730	Streamliner		
			Sedan, 4d., 6p.	1165	3300	DeLuxe-85			NASH			Conv. Sedan, 5p.	1723	3725	Eight		
Super 41-50			Club Coupe, 5p.	1142	3260	Coupe, w.f.s....	755	2969	Ambassador						Sedan Coupe....	948	3370
Sport Coupe....	1031	3623	Town Sedan, 6p.	1198	3315	Coupe, f.s....	785	3001	Special 600			Super Eight			Sedan, 4d.....	1005	3425
Tour. Sedan, 4d.	1113	3670	Conv. Coupe....	1315	3470	Tudor Sedan....	795	3110	Business Coupe.	730		One Sixty—			Sup. Sed. Cpe..	994	3385
Conv. Coupe....	1267	3810	Limousine, 7p..	1410		Fordor Sedan...	835	3146	Sed. Sips., 4d.	805		1903			Sup. Sed., 4d...	1051	3460
Conv. Phase., 4d.	1555	4014				Sedan Coupe....	825	3052	Sed. Sips., 2d.	765		Bus. Coupe, 2p.	1594	3875			
			Saratoga			Conv. Club Cpe.	920	3187				Club Coupe, 2-4p	1709	3800	Custom Eight		
Century 60			C-30-N			Station Wagon..	985	3419				Tr. Sed., 4d., 5p.	1750	3865	Sedan Coupe....	1020	3325
Bus. Coupe.....	1195	3870	Coupe, 3p.....	1245	3600				DeLuxe 600			Conve. Cpe., 2-4p	1892	3965	Sedan, 4d.....	1077	3430
Sedanet, 2d.	1241	3920	Brougham, 6p..	1293	3715	HUDSON			Business Coupe.	772		D. C. Cpe., 2-4p.	2067	3985	Sta. Wag.	1200	3715
Tour. Sedan, 4d.	1288	4025	Sedan, 4d., 6p.	1320	3755	Traveler-10			Sed. Sips., 2d.	837	2630	Conv. Sedan, 5p.	2180	4140	Sta. Wag. DeL..	1250	3730
			Town Sedan, 6p.	1350	3750	Coupe, 3p.....	713	2790	Sedan, trk., 4d.	880	2655	D. Conv. Sed., 5p	2405	4160			
Roadmaster			Club Coupe, 5p.	1299	3685	Sedan, 2d., 6p.	783	2850	Sed. Sips., 2d.	797					STUDEBAKER		
41-70						Sedan, 4d., 6p.	806	2840							Champion		
Sport Coupe....	1282	3920	New Yorker,				811	2900	Ambassador 6			1904			Custom		
Tour. Sedan, 4d.	1364	4010	C-30-K			DeLuxe-10			Bus. Coupe, Spl.	890		Tr. Sed., 4d., 5p	2009	4305	Coupe.....	710	2355
Conv. Coupe....	1457	4045	Coupe, 3p.....	1325	3635	Coupe, 3p.....	821	2840	Bus. Coupe, Spl.	940	3180				Coupe, 5p.....	750	2375
Conv. Phase., 4d.	1775	4269	Brougham, 6p.	1369	3745	Sedan, 2d., 6p.	842	2900	Sed., Spl., 4d.	970	3300	1905			Club Sedan....	755	2420
			Sedan, 4d., 6p.	1389	3775	Club Coupe, 6p.	868	2895	Brougham, 2d.	1008	3235	Tour. Sedan, 7p.	2161	4495	DeLuxe		
Limited 41-90			Club Coupe, 5p.	1369	3690	Sedan, 4d., 6p.	876	2950	Sed., DeL., 2d.	1020	3300	Limousine.....	2289	4570	Coupe.....	745	2365
Tour. Sedan, 6p.	2155	4575	Town Sedan, 6p.	1399	3785	Convertible, 6p.	1083	2980	Sedan, trk., 4d.	1065	3300	One Eighty—			Coupe, 5p.....	780	2385
Limousine.....	2465	4760	Conv. Coupe....	1548	3945				Sedan, 4d., 6p.	933		1906			Club Sedan....	785	2430
Formal Sed., 6p.	2310	4565	Spec. Twn. Sed.	1760	3900	Super Six-11			Cabriolet.....	1130		Conv. Vict., 5p.	4550	4040	Cruis. Sedan....	825	2460
			Twn. Car, 6p..	1412		Coupe, 3p.....	901	2935							DeLuxe-Tone		
			Twn. Car, 9p..	1492		Sedan, 2d., 6p.	921	3000	Ambassador 8			1907			Coupe.....	780	2380
						Club Coupe, 6p.	956	2980	Sed., Spl., 4d.	1091	3465	Tr. Sed., 4d., 5p.	2587	4350	Coupe, 5p.....	815	2400
			Crown Imp.			Sedan, 4d., 6p.	952	3050	Brougham, 2d.	1116	3400	Formal Sed., 5p.	3045	4380	Club Sedan....	820	2445
			C-33			Convertible, 6p.	1175	3125	Sed., DeL., 4d.	1141	3455	Brougham, 5p..	3500	4450	Cruis. Sedan....	860	2475
CADILLAC			Sedan.....	2595	4435				Sedan, trk., 4d.	1186	3475	Sport Sedan, 5p.	4750	4490			
Series 61			Sedan, 8p.....	2695	4495	Commodore			Cabriolet.....	1260					Commander 6		
Coupe, 5 p....	1345	3985	Limousine.....	2795	4560	Six-12						1908			Custom		
DeL. Coupe, 5p.	1435	4005				Coupe, 3p.....	981	3000	OLDSMOBILE			Tour. Sedan, 7p.	2724	4590	Cruis. Sedan....	1010	3135
Tour. Sedan, 5p.	1445	4065	CROSLEY			Sedan, 2d., 6p.	1012	3050	Special Six			Tr. Lim., 7p...	2868	4650	Land Cruiser...	1055	3160
DeL. Tour. Sed.	1535	4085	Coupe, 2p.....	325	950	Club Coupe, 6p.	1043	3045	Bus. Coupe, 3p.	852	3145	Town Car.....	4775	4200	Sedan Coupe....	990	
			Coupe, 2-4p....	1420	3950	Convertible.....	1247	3160	Club Coupe, 3-6p	893	3185	Tr. Sed., LeB., 7p	5300	4740			
Tour. Sedan....	1495	4030	Std. Sedan, 4p.	375	975				Sedan, 2d., 6p.	898	3190	Tr. Lim., LeB., 7p	5550	4850	DeLuxe-Tone		
DeL. Cpe., 2-4p.	1510	3970	DeL. Sedan, 4p.	385	975	Commodore			Sedan, 4d., 6p.	945	3230	1951			Cruis. Sedan....	1075	3155
DeL. Tr. Sed....	1585	4050	Pkw. Delivery...	399	1030	8-14			Conv. Cpe., 3-6p	1048	3355	Tr. Sed., 5p., 4d.	1375	3725	Land Cruiser...	1120	3180
DeL. Conv. Cpe.	1645	4055	Pick. Delivery...	399	1100	Coupe, 3p.....	1024	3135	Station Wagon.	1176	3565	PLYMOUTH			Skyway		
DeL. Conv. Sed.	1965	4230	Conv. Wag., 2p.	425	1075	Sedan, 2d., 6p.	1049	3210	Town Sed.....	945	3220	Coupe, 2p.....	720	2809	Cruis. Sedan....	1100	
			Panel Delivery.	417	1100	Club Coupe, 6p.	1086	3210				Sedan, 2d., 5p.	769	2859	Land Cruiser...	1130	
			Sta. Wag., 2p..	479	1135	Convertible, 6p.	1297	3350	Dynamic Six			Sedan, 4d., 5p.	800	2889	Sedan Coupe....	1180	
			Sta. Wag., 4p..	470	1160				Club Sedan, 6p.	954	3325	Utility Sed., 2d.	760	2794			
						Commodore			Sedan, 4d., 6p.	1010	3390				President 8		
Series 63						Cust. 8-15			Bus. Coupe....	908	3260	DeLuxe			Custom		
Tour. Sedan, 5p.	1695	4110	DE SOTO			Coupe, 3p.....	1110	3185				Coupe, 2p.....	760	2839	Cruis. Sedan....	1140	3390
			De Luxe			Club Coupe, 6p.	1173	3235	Custom Six			Sedan, 2d., 5p.	859	2889	Land Cruiser...	1185	3420
Series 60S			Coupe, 3p.....	945	3134				Club Coupe, 3-6p	1043	3320	Sedan, 4d., 6p.	845	2924			
Tour. Sedan, 5p.	2195	4230	Sedan, 2d., 3p..	1008	3224	Commodore			Sedan, 4d., 6p.	1099	3410				Special DeL.		
Tr. Sed. Div., 5p.	2345	4290	Sedan, 4d., 6p.	1035	3254	Cust. 8-17			Conv. Cpe., 3-6p	1191	3525	Coupe, 2p.....	795	2859	Coupe, 2-4p....	842	2934
			Sedan, 7p.....	1270	3629	Sedan, 4d., 6p.	1278	3400				Sedan, 2d., 5p.	845	2934	Sedan, 4d., 6p.	845	2934
			Club Coupe, 5p.	1025	3219	Big Boy-18			Special Eight			Sedan, 4d., 5p.	877	2959	Sedan, 4d., 6p.	877	2959
						Carroll, 6p.....	3165		Club Coupe, 3-6p	935	3300	Conv. Cpe., 2-4p	1007	3166	Sedan, 7p.....	1078	3379
			Custom			Sedan, 6p.....	3155		Bus. Coupe....	893	3260	Station Wagon.					

DETROIT LETTER

(Continued from page 45)

The OPM has set passenger car production for the four months from August through November at 817,000 units, a reduction of 26½ per cent from the 1,113,000 passenger cars produced in the same months of 1940. As approximately 90,000 passenger cars were assembled in August, this leaves 727,000 vehicles to be made in the next three months, an average of 242,300 units per month. This compares with an average of 358,000 passenger cars per month turned out in the 1941 model year. General Motors, Ford and Chrysler will cut their passenger car production by 27.6 per cent for the four months, which will permit the smaller companies—Studebaker, Hudson, Nash, Packard, Willys and Crosley—to cut output only 20.2 per cent.

However, the limitation of output to 817,000 passenger cars through November is no guarantee that that many cars will be built. The raw materials situation is still serious, so shortages of steel, aluminum, chrome, copper and nickel may cut production below the quota set. Heavy trucks of two tons and upwards capacity and trucks of lighter rating for military use have priority for such materials, along with all the other defense priorities for aircraft, tanks and ammunition.

Although the first 1942 models shown to dealers and distributors at Detroit have equally as much or more brightwork and trim than the 1941 cars, it is quite possible that this may be reduced in quantity or eliminated entirely. At a recent meeting with OPM in Washington, the manufacturers agreed to eliminate virtually all decorative trim, aluminum pistons and sponge rubber in upholstery. Some companies already have on hand sufficient brightwork for trim and enough aluminum pistons for their 1942 model production needs. Whether they will be able to carry out their plans remains to be seen. It is possible that body trims and engine changes may have to be made halfway through the 1942 model year.

August production in the U. S. and Canada was approximately 155,000 units, the largest for the month since 1937 and 71 per cent greater than August, 1940. Ford accounted for more than one-third the August total as the company continued 1941 model production until the end of the month. Plymouth was the biggest producer of 1942 models, while Hudson, Packard, Willys, Nash and Studebaker also had begun 1942 model production. The others will complete their retooling in September.

Retail passenger car sales registered a 38 per cent gain over 1940 in the first six months of 1941, totaling 2,548,209 units, according to the A.M.A. Chrysler Corp. consumer de-

liveries for the first half of 1941 were 686,112 vehicles, a 34 per cent advance over 1940. General Motors retail sales of 1,383,122 units in the first six months were 47 per cent greater than the same period of 1940. For July, G.M. retail deliveries of 195,475 vehicles were up 35 per cent over July, 1940, while Studebaker sales of 13,503 units were the greatest for the month since 1923 and 50 per cent greater than July, 1940. Only 155,770 new passenger cars were estimated in U. S. dealer stocks as of July 1, less than two weeks' supply at the 1941 selling pace.

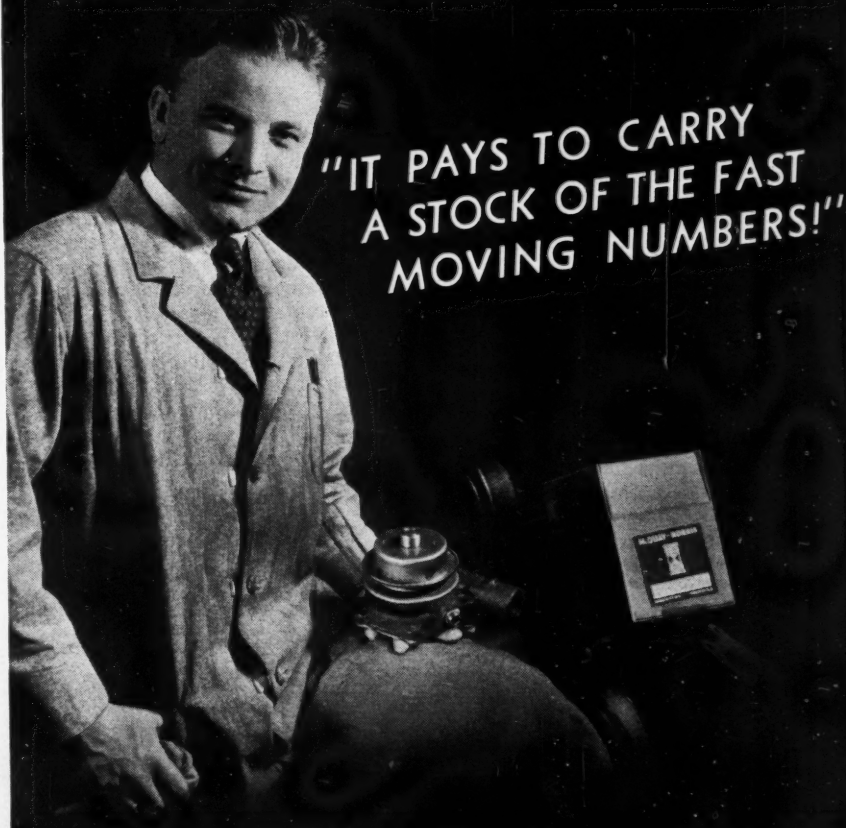
Chicago Dealer Group

Wins Management Award

For "outstanding accomplishment in the promotion of business management among motor vehicle dealers," the Chicago Automobile Trade Association has won the John N. Van der Vries Award offered by the National Institute For Trade Organization Executives through the institute's alumni association.

Presentation of the award was made at a ceremony, recently, with Ben T. Wright, president of the CATA, receiving it for the association.

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"LET'S DO THE BIG JOB RIGHT!"



LEGALLY SPEAKING

A lawyer's interpretation of Federal and local court decisions of interest to repairmen, presented each month

By C. R. ROSENBERG, JR.

Agent's Authority

Repairmen have occasionally had the experience of making a deal with a business concern or individual through a supposed agent or representative, only to have the transaction repudiated by the concern or individual with the statement that "He had no authority to represent us in this matter."

Of course, nobody can be bound by the acts of his supposed agent unless the agent actually had authority from the principal for whom he purports to act. Yet there is such a thing in the law as "ostensible agency"—meaning circumstances from which the repairman may reasonably infer that the supposed agent really has authority from the concern or individual he claims to represent.

"The two essential elements of an ostensible agency," said a California court recently, are:

"First, that the third party dealing with the agent believe in good faith that the agent had authority;

"Second, that such belief arise from the act or negligence of the person or concern alleged to be the principal for whom the agent is acting."

The catch is to find some "act or negligence" by the principal tending to show that the agent really has authority. Previous similar transactions by the agent approved by the principal might be enough in some in-

stances. If the principal accepts the benefits of a deal made by the agent, he thereby "ratifies" the agent's acts.

Ordinarily, if an argument arises as to the agent's authority to enter into a particular transaction on behalf of his principal the burden is on the repairman who dealt with the agent to prove that the agent had the authority from the principal, not on the principal to prove that the agent did not have the authority. All the principal has to do is to deny that the agent had the authority. The repairman has to go on from there. Just a roundabout way of saying, "Be sure whom you're dealing with." (*County First National Bank vs. Coast*, 112 *Pacific Reporter*, second series, 315.)

Tenant's Business Fixtures

A tenant repairman is protected in his ownership of business fixtures which he installs in a rented building, if the fixtures are not "permanently affixed" to the building.

"Where personal property such as business fixtures and equipment," said the Supreme Court of Oklahoma recently, "is attached to the premises by a tenant for the purpose of carrying on his business and not to improve the premises, it is generally held that such fixtures are to be treated as trade fixtures and that

America looks to the repairmen of this nation to keep motor transportation efficient and economical. It's a big job...a grave responsibility...a great opportunity.

Below is a miniature of a plaque that alert repairmen everywhere are hanging on their walls. The actual plaque is bronze colored, 13 by 16 inches.

THE MAINTENANCE
OF TRANSPORTATION IS A
VITAL NECESSITY IN OUR
NATIONAL EMERGENCY. IT
IS OUR AIM TO HELP KEEP
AMERICA'S CARS, TRUCKS
AND TRACTORS RUNNING
EFFICIENTLY AND
ECONOMICALLY.



McQUAY
Let's



they are removable by the tenant at the expiration of his lease where this can be done *without any substantial injury to the leased premises.*"

As the court infers, if it appears that the removal of the fixtures would cause substantial damage to the building, the law will assume that the tenant intended them to be permanent improvements to the building. They would then belong to the owner of the building and the tenant could not remove them, no matter how much he paid for them originally.

A repairman renting a building for business use should make sure that the lease contains a provision permitting him to remove all fixtures he installs, no matter how they are "affixed" to the building. (*Carte-Caldwell vs. Berryhill*, 112 *Pacific Reporter*, second series, 370.)

Repairs After Accident

After a customer has been hurt through some alleged defect in the repairman's place of business, may the repairman safely make repairs or take precautions to prevent a recurrence of the unfortunate incident? Isn't it possible that the subsequent repairs or precautions may be introduced in a lawsuit by the injured person to show that there actually *was* a "defect" requiring repairs or precautions?

A California court recently pointed out that subsequent repairs or precautions cannot be brought up against the repairman in such a lawsuit.

"It is well settled," said the court, "that evidence of precautions taken or repairs made subsequent to the happening of an accident is inadmissible to show negligence at the time of the accident."

"Inadmissible" means that the sub-

sequent repairs or precautions cannot be mentioned or considered at the trial of the accident case. (*Hatfield vs. Levy*, 112 *Pacific Reporter*, second series, 277.)

Can't Get "Remote" Losses

If a repairman suffers financial loss through the breach of a contract by the other fellow to the deal, he is entitled to collect compensation for his losses from the other party. Such compensation for losses is called in the law by the name of "damages."

To collect damages, however, the repairman must be prepared to show just what his losses were and also that they were directly attributable to the wrongful breach of the contract. If he cannot do that, he cannot collect. Losses that are speculative or uncertain or "too remote" from the breach of the contract cannot be collected from the guilty party, though the repairman be morally certain that the wrongful breach of the contract caused them.

As the Supreme Court of Louisiana put it in a recent case:

"Remote and uncertain damages are not recoverable even though the contract was breached through bad faith, because they cannot be attributed with any degree of certainty to the breach of the contract. It cannot be determined whether they are connected with other causes."

Because of this uncertainty of damages arising out of a breach of contract, some contracts contain a stipulation of a fixed amount for which the guilty party shall be liable to the other in the event of a breach. Such a stipulation, which avoids uncertainty on this point, is called a "liquidated damages" clause. (*Spencer vs. Luckenbach*, 2 *Southern Reporter*, second series, 53.)

HERE'S HOW!

To do a complete job, to render complete service, you need The Complete Parts Line. And that's just what McQuay-Norris offers. McQuay-Norris Parts work better because they are engineered to work together. You'll do a better job all around with The Outstanding Parts Line including the rings that are engineered in fact as well as name—McQuay-Norris Altinized Engineered Piston Ring Sets.



McQUAY-NORRIS MANUFACTURING CO.

Let's keep cars, trucks and tractors rolling!

NEWS

(Continued from page 46)

to appeals of the National Association of Automobile Dealers to underwrite expanded activities of the association in Washington. Individual dealers feel, with sufficient reason, that as a group they are to be hit severely by curtailment of production, by taxation, and to some degree by restriction of installment selling. The chief objective of the new activities is to tell the public and Washington that the dealer body of America performs a far too

important function in our national life to be endangered by discrimination.

Whether dealers are too late in becoming vocal no one can say. Whether there was ever a time when a group of honest business men could make themselves heard above the clamor for regulation in Washington is a matter of dispute. It is certain, however, that dealers will do themselves and the industry eventual good by taking their case to the public.

Perhaps there is still time to present the dealer case with regard to taxes, since the levies now being discussed

in the House are not likely to become law for some weeks. New-car production will be governed entirely by defense needs. Installment restrictions, so far as they have been suggested, will not greatly affect sales, as the increase in down payments on new cars from 25 to 33 1/3 per cent will not likely deter buying so much as the inability to get new cars.

If the dealer spokesmen are wise, they will devote a major part of their energy to demanding priorities for repair parts. Service is going to be the salvation of dealers if sufficient new cars are not produced, and there is every reason to believe they will not be. Since there can be no service without replacement parts, the new dealer effort to defend their rights and their business would be incomplete without due emphasis on the necessity for parts.

Even with the likelihood that service business will increase, dealers have plenty to occupy the moments they set aside for worrying. However, there is one point on which they seem too pessimistic. It is common to hear dealers say they will have little help in this fight, because car factories will be kept busy filling defense orders, and will be little interested in what happens to dealers.

This seems to be placing too little value on rôle played by dealers. A car factory stands or falls on the caliber of its dealer organization. When the war ends, that factory must, if it is to survive, return not only to making but to selling automobiles. The selling must be done by dealers, and the factory that has let its dealer organization deteriorate has piled up grief for itself. From their interest in self-preservation, factories cannot remain indifferent to the plight in which dealers will find themselves if new cars are not forthcoming in sufficient quantities.

CORNY SOLUTION


NOW that the gasoline shortage is about to begin pinching in the East, and Canada is seriously studying the possibility of using alcohol as a motor fuel, it is about time for a farm belt Congressman to suggest the same solution in this country. Although Canada is considering her surplus wheat as the source of alcohol, the crop that has always appealed to politicians on this side of the border is corn. Any hint from the politicians that the gasoline shortage here can be relieved by using alcohol is therefore likely to have a corny odor.

Production of alcohol for power has long been a dream of corn-belt politicians. As long ago as 1907, the national tax on alcohol was removed in the expectation that industrial use would be stimulated, but farmer constituents did not grow rich. During the great depression, many attempts were made to compel the use of alcohol. Twenty bills with this intent

(Continued on page 64)

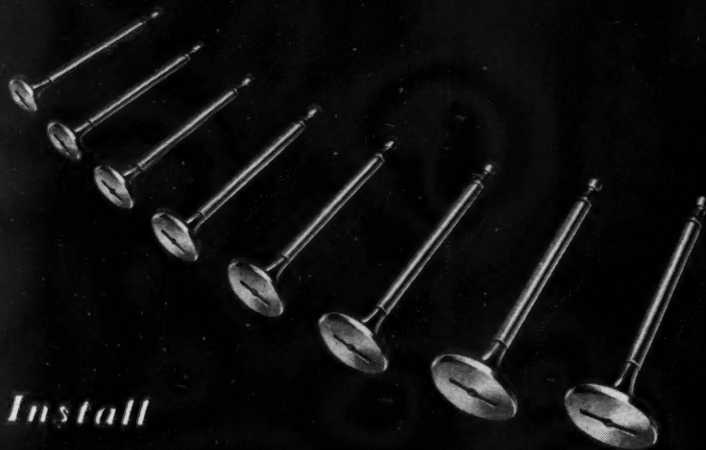
Exclusive!
only **McQUAY-NORRIS**
Factory Type Set
**PISTON RINGS ARE MADE OF
ELECTALLOY AND ALTIMIZED**

*"...and man,
what a difference
that makes!"*



**MADE TO OUTPERFORM
PRICED TO OUTSELL**

Constantly Improved
By The World's Largest
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RICH VALVES

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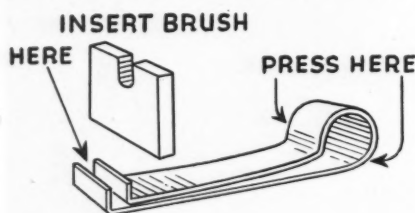
MCQUAY-NORRIS JOBBERS

SHOP KINKS



INSTALL GENERATOR BRUSHES

Here is a sketch of a holder I made to help install generator brushes. It is made of spring steel, shaped so that the brush is held firmly in the jaw. When the brush is in position, simply pressing the loop of the tool spreads the jaws and releases the brush. It saves time, and is easy on the disposition when doing these jobs in a hurry. *Louis A. Rall, Galesville, Wis.*



TEST VACUUM ADVANCE

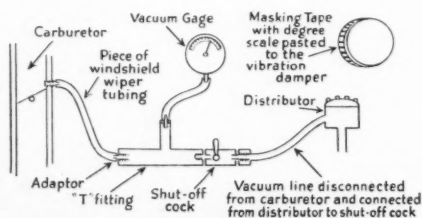
Here is an idea I have been using for checking the distributor vacuum advance in connection with, and independent of, the governor weight advance.

It is important to know, first, if the vacuum advance is operating; second, if it is advancing properly. Therefore, it is necessary to know the degrees of advance, and this is hard to determine because many cars do not show the degrees on the vibration damper. So I first make a degree scale for the vibration damper. Here is the formula I use: 1.4 times the diameter of the damper gives the number of 32ds of an inch in 5 degrees of rotation. For example, a 6 in. diameter damper, times 1.4 equals 8.4. This means that there are 8.4 1/32ds of an inch to each 5 degrees. Then I take a piece of masking tape and measure off 8.4 32ds of an inch and draw a line on the tape—the line representing 5 degrees of ignition advance. If the car is supposed to have 20 degrees of advance, I draw four lines on the tape. I use white or yellow paint for the lines.

The next step is to put No. 1 piston on top center, make a timing pointer above the vibration damper (if it doesn't have one), and paste the masking tape on the damper with the front end of the tape lining up with the timing pointer, indicating top center.

Remove the fitting from the side of the carburetor leading to the vacuum advance plate in the distributor. Screw in an adaptor so that a piece of windshield wiper tubing can be attached. Connect the other end of the tubing to an adaptor in a "Tee" fitting. Connect the vacuum gage line to the long side of the "Tee" fitting. Connect a shut-off cock to the "Tee" fitting in the other end opposite the end to which the line from the carburetor is attached, and connect the tubing from the distributor advance plate to the other end of the shut-off cock.

Now you are ready to make the test. With the shut-off cock closed, start the engine and bring the speed up to the vacuum gage reading at which the vacuum advance plate is



supposed to start moving. Note the degrees of advance already reached at this engine speed, by checking the degree scale on the vibration damper with a timing light. Then open the shut-off cock suddenly and watch the degree scale to see if the timing advances. For example, suppose the vacuum advance should start at 10 inches of vacuum. Set the engine speed at the point where the vacuum gage will read 10 inches with the shut-off cock closed. When you open the shut-off cock, the timing should advance slightly over that already

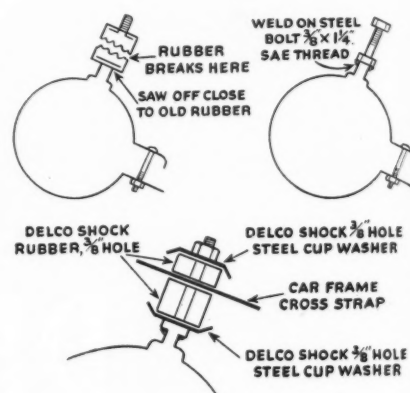
reached by the governor weight advance. This will show whether the vacuum advance unit is starting to operate at the proper time.

If the engine, for example, is supposed to have full vacuum advance of 20 degrees at 17 inches of vacuum, set the engine speed to give this gage reading and check the degree scale on the damper with the shut-off cock closed. Then suddenly open the shut-off cock and read the total amount of advance, the increase being the amount of vacuum advance. *Thomas J. Lyons, Indianapolis, Ind.*

MUFFLER HANGER REPAIR

I use a method of my own to repair the broken muffler hanger on late model Ford cars.

Cut off the stud in the muffler strap, just below the rubber bushing. Weld the head of a $\frac{3}{8}$ x $1\frac{1}{4}$ in. cap screw to the part of the stud remaining on the strap. Take two shock absorber link rubber bushings or grommets and



the cup-shaped steel washers which go with them, and install them on the stud, locating the cross member or hanger strap over the stud and between the two rubber grommets. (If the rubber grommets are too long, you can cut them in half). Then run a nut down on the cap screw, and you have a muffler support that will not break. *H. W. Doebel, Doebel's Service Garage, Hanlontown, Ia.*

CUTTING OIL GROOVES

Here is a quick neat method of cutting oil grooves in babbitt bearings. Get a discarded drill from your dentist—the type that he calls a "burr"—and use it in your electric hand drill. The burr has a round end with flutes machined on it, and when used in a drill makes an ideal tool for cutting a groove in the soft babbitt.



I draw the groove on the bearing with pencil to have a guide, and then cut it with this drill in a few seconds. *Emil J. Novak, 2215 So. 13th Street, Omaha, Neb.*

For America's

Defense

Studebaker has been assigned
the responsibility of building airplane engines and
military trucks on a large scale

For America's

Transportation

Studebaker builds three great models of
passenger cars—the President Eight, the Commander, the
Champion...and low-cost trucks and commercial cars

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STUDEBAKER is justly proud
of the part it has been as-
signed in the nation's produc-
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America's matchless motor-
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To the public at large, and
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and owner, Studebaker pledges
itself to discharge all its re-
sponsibilities to the best of its
ability—and in a manner that
will add luster to the world-
respected Studebaker name.



H. S. VANCE, CHAIRMAN • PAUL G. HOFFMAN, PRESIDENT

NEWS

(Continued from page 60)

were introduced in Congress and 31 in various state legislatures. Most of the bills sought to gain their ends by exempting alcohol blends from most or all the motor fuel tax. Nebraska has had two laws of the kind, but in no case has alcohol made headway as a fuel.

Reasons for the unpopularity of alcohol for producing power are numerous. One is its inferiority to gasoline in calorific content. Used without ad-

justing the engine, performance suffers because the mixture at the same carburetor adjustment is too lean. When the setting is changed, performance improves but mileage falls off.

It is often argued that alcohol has less tendency than gasoline to engine knock, and that is true. But the octane rating of gasoline can be raised more cheaply by adding tetraethyl lead than by blending with alcohol.

Further, some engineers, though not all, find that starting is more difficult with blends, a fact that results in excessive choking and consequent loss of fuel. And there are also



"I don't know what you guys see in that office girl—she's slow, she's dumb, she can't do a thing right."

minor difficulties. Danger of vapor lock is increased, and, since alcohol is a solvent, it attacks the finish and trim of cars when it chanced to be spilled when refueling. Its solvent properties pose difficulties in another direction. Sometimes it loosens foreign matter in the fuel system and this matter is carried along until it plugs a small orifice and stops the engine.

Separation is a constant problem with blends. Alcohol is hygroscopic, which means that it readily absorbs and retains water. And gasoline will not mix with alcohol in the presence of water.

By far the greatest obstacle to common use of alcohol as a fuel, however, is its cost, which is greater than it would be for alcohol as a beverage or for many industrial uses, as all water must be forced out. A few years ago a plant at Atchison, Kan., offered alcohol to the motor fuel trade at 25 cents a gal., but the experiment ended in bankruptcy in 1938.

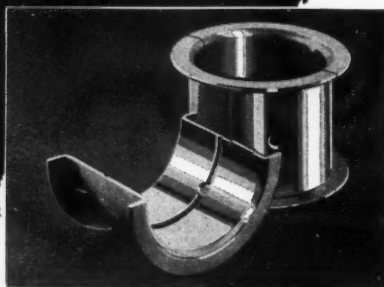
Based on the present price of corn, it is estimated that the addition of 10 per cent of alcohol to gasoline would increase the per gallon cost of fuel by 3.55 per cent. The problem of transportation, which is the one responsible for the threatened rationing of gasoline, would remain.

On the face of it, alcohol does not look like the answer, yet the hearts of some Congressmen bleed so easily on behalf of farmers that we may yet hear something of it. That is, of course, if fixing farm products prices at 110 of parity is not enough to insure votes next year.



JOHNSON

Slip-in BEARINGS



The next time you need bearings—try Johnson Bronze. You will save both time and money. Complete stocks . . . for every type of car . . . are carried in every principal city. Delivery can be made the same day your order is received.

Johnson *Slip-in* bearings cost less per job . . . less per mile. Correct in every dimension, they slip right into place with the minimum of effort. The high standard of quality of all Johnson bearings enables you to guarantee every installation. Ask your jobber—today—for Johnson *Slip-in* Bearings.

Write for
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Catalogue



JOHNSON BRONZE

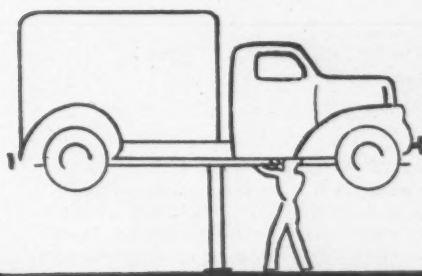
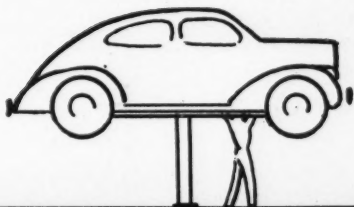
Sleeve BEARING HEADQUARTERS

455 S. MILL STREET • NEW CASTLE, PA.

Stewart-Warner Net

Shows 6-Month Increase

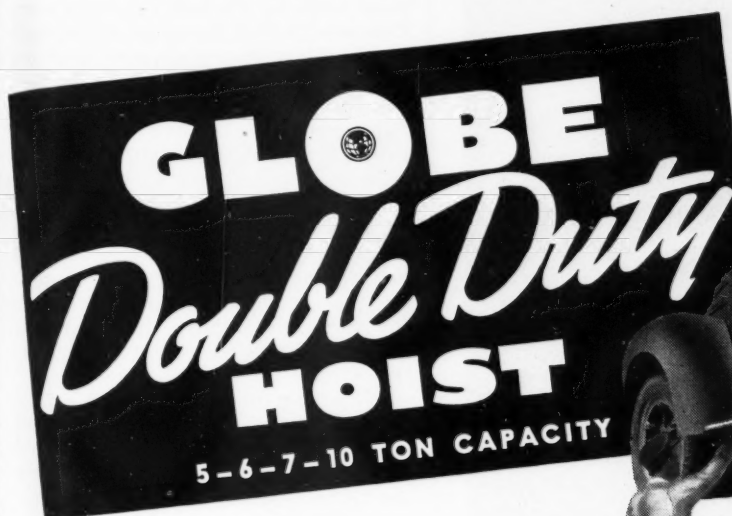
Stewart-Warner Corp. and subsidiaries, for the first six months of 1941 ended June 30, reported a tax-adjusted surplus net profit of \$770,272 after provision of \$2,112,607 for present and contemplated federal and other income taxes, according to the consolidated semi-annual statement mailed yesterday to stockholders.



PASSENGER CAR SERVICE

TRUCK SERVICE

Extra Profits for you in TRUCK Servicing!



...the Hoist that handles
TRUCKS as well as
all passenger cars

Garages and service stations
everywhere are using Globe
DOUBLE-DUTY Hoists to
add the profitable and
dependable volume of truck
service business to their
regular passenger car work.

You can do a Two-lift volume with a One-lift investment when you equip with a Globe **DOUBLE-DUTY** Hoist.

You can service **TRUCKS** as well as passenger cars, because these big, rugged Hoists handle loads from 12,000 to 20,000 lbs.

Add this truck servicing to the automobile business you are now doing—with only one lift space requirement—with only one lift installation cost.

Globe **DOUBLE-DUTY** Hoist is available in either Roll On or Free Wheel superstructure . . . and with the same exclusive features of construction that have made Globe Hoist dominant equipment in the lift industry.

Write today for the **FREE** book, "How to Increase Your Profits By Servicing Trucks."

GLOBE HOIST COMPANY
DES MOINES, IOWA • PHILADELPHIA, PA.

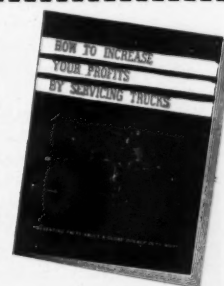
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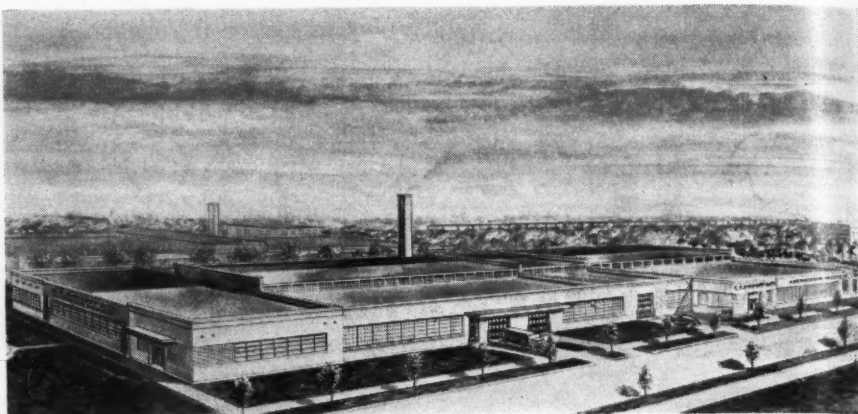
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View of the C. E. Niehoff & Co. factory at Chicago, as it will appear when the addition now under way is completed. The expansion was made necessary by increasing demand for the ignition, brake, and magneto parts produced by the company.



FRONT END

(Continued from page 25)

lower control arm, as shown in Fig. 3. Start the new pivot pin in the front lower control arm, holding the knuckle support arm centralized between the yoke made by the lower control arms. Continue to turn the pivot pin through the bushing in the support arm and the front control arm until it enters the rear control arm. If the threads index properly, the pin will continue through the rear arm without spreading the yoke; if they do not, and the yoke starts to spread, use a "C" clamp, as shown in Fig. 4, to compress the arms of the yoke slightly so that the bolt threads will index with those in the rear control arm properly. Turn the pivot pin in until its head seats firmly against the front lower control arm.

With a wire hook, slip the front seal into position over the threads of the pivot bolt, and slide the rear seal off the end of the bushing so it covers the threads of the bolt.

Replace Upper Arm Pin

Raise the car with a chain hoist and place a jack under the spring pad. Remove the tire and wheel assembly. Remove the threaded bushing in the rear of the upper control arm. Remove the clamp bolt in the front arm, and remove the front bushing. Then loosen the clamp bolt in the knuckle support arm, and turn the pin out of the arm.

When installing a new pin and bushings, first place two rubber seals over the ends of the control arms, as shown in Fig. 5. Locate the knuckle support arm in the center of the yoke, and turn in the pivot pin until the section having the largest diameter is centered in the support arm, as shown in Fig. 5. Tighten the clamp bolt to hold the pin to the support arm. Then start the rear bushing in the arm and on the pivot pin, being sure to hold the support arm in the center of the yoke. Tighten the bushing, and then recheck to be sure the support arm is still centrally located in the yoke.

(Continued on page 68)

MEETING the needs of the defense program for bearings, bearings and yet more bearings has been as disconcerting as a parachute jump for us and for our customers. Meeting the defense needs is the number one job, of course. But the number two job, as we see it here at Ahlberg, is to settle down to making every possible effort to filling the normal needs of our normal customers in the most normal possible way. And we believe we are beginning to succeed at both jobs pretty well, thanks to the patience and cooperation of the people who depend on Ahlberg.

Ahlberg Bearing Company
Manufacturers of CJB Master Ball Bearings
3020 WEST 47TH STREET - CHICAGO - 30 WAREHOUSE BRANCHES
Out West at PRECISION BEARINGS, INC. Los Angeles



IS IT JUST **LUCK?**

**OR DO BOWES SPARK PLUGS
REALLY HAVE WHAT IT TAKES?**



RALPH HEPBURN
Finished 4th, Indianapolis,
in '41 Classic



REX MAYS
Winner of 1940 AAA
Racing Championship



JIMMY WILBURN
Central States Dirt Track
Champ for '38, '39, '40



CLAYTON BISHOP
Hudson River Outboard Winner
in '39 and '40



BOWES



SPARK PLUGS

● It takes *more* than a horseshoe under the hood to spark a winner home . . . anyway, that's what these boys tell us and they ought to know . . . they *depend* on Bowes Plugs to get them into the money.

And it's more than a matter of Luck that Spark Plug Experts all over the country . . . thousands of 'em . . . are switching to Bowes Spark Plugs. They, too, are depending on Bowes Plugs to make good profits and good reputations for themselves.

If you want greater plug profits . . . If you want to handle a line that can't be "chiseled" . . . and if you want the satisfaction that goes with selling customer-pleasing Bowes Spark Plugs . . . stock Bowes Plugs . . . they've

PROVED THEY CAN "TAKE IT"

FRONT END

(continued from Page 66)

Then screw in the front bushing until there is between 0.020 and 0.040 in. clearance between the head of the bushing and the upper control arm, as shown in Fig. 6. It is very important that this clearance be maintained to prevent binding the threads of the pivot pin.

Using a wire hook, as shown in Fig. 7, pull the rubber seals over the ends of the arms so that they cover the threads of the pivot pin. Then

tighten the clamp bolt in the front arm.

Install the wheel and tire assembly and set the car back on the floor.

It is always necessary to check caster and camber whenever a new pivot pin is installed.

Guide Lamp Introduces New Merchandising Plan

Guide Lamp representatives of United Motors Service now in the field contacting distributors on the Guide merchandising program for 1941-1942 are stressing the new sim-

plified lighting service which will allow more dealers to synchronize their sales efforts with various national campaigns for safer driving.

Among the new products being introduced are the Guide deluxe fog lamp with two-tone lens; the Guide master fog lamp with two-tone lens; five new custom brackets, including a universal bracket for virtually any car or truck; Guide directional signals for accessory installation which can be installed on steering column.

In addition, Guide is offering the new Guide glare-proof mirror, an exclusive automobile accessory.

New service tools, at lower prices and simpler groupings, are also being offered. The point-of-sales helps include auxiliary lamp display, metal counter display, lens and sealed beam unit display, cloth pennants, metal display signs, mailing cards, book matches, movie trailer and other merchandising material. The new catalog provides quick reference for equipment for all types of vehicles.

U. S. Rubber Income Higher for 6 Months

Consolidated net income of United States Rubber Co. for the six months ended June 30 was \$6,203,314, equal, after preferred dividends, to \$2.07 a common share, F. B. Davis, Jr., chairman and president, has announced. This compares with \$4.234,239, or 94 cents a share, for the corresponding period of 1940.

Net sales billed in the first half of this year amounted to \$150,677,739, or 37 per cent above the \$109,782,572 total for the first half in 1940.

Taxes on excess profits and income, including foreign income taxes, and provision for tax contingencies, estimated at \$8,398,720, were 268 per cent greater than the \$2,283,927 provided for in the first six months of 1940. Before deductions of these taxes, net income this year was \$14,651,311, as against \$7,001,117 in the same period last year.

Introduces Road Signs

The Merchandising Division of The Electric Auto-Lite Co. has added double-faced highway signs to the already large national advertising program that sells Auto-Lite spark plugs. These signs are spotted strategically along the nation's heaviest traveled roads and tie in closely with point-of sale display furnished Auto-Lite dealers.

There are actually two signs attached to one solid 8-foot post. The top sign, 6 by 4 feet in size, smashes across a selling message on Auto-Lite spark plugs. The lower sign reminds motorists to "Get an Auto-Lite 'Plug-Check'." By supplementing Auto-Lite's national advertising campaign on its spark plug and merchandising its ingenious "Plug-Check," these bulletins do a double-barreled job.

"Just what I need for faster tune-ups"





Vacuum gauge has 3 1/2" dial with motor readings in color, adjustable screw and 4 ft. tubing.



Compression gauge has 2 1/2" dial, replaceable cover, and universal cone adaptor.



Neon Timing Light made of durable ivory plastic with red-lacquered cables.

Snap-on TUNE-UP SET

Simplifies Testing — Speeds Service

With these three tools any mechanic can quickly tell "what's wrong with a motor, and where", he can shorten tune-up time, turn out sweet-running jobs that bring more business. Furthermore, each tool is a dependable, precision instrument. The vacuum gauge and motor analyzer accurately detects a wide range of engine troubles from leaky manifolds to weak valve springs . . . the compression gauge "holds" the highest reading exactly until release button is pressed . . . the neon timing light has lens construction that lights up timing marks with unusual sharpness . . . gives a wide range of brilliance for testing spark plugs.

MORE REPAIR WORK . . . FEWER TO DO IT!

TOOLS WILL TELL IN '41!



Designed like a watch, with bushed bearings and ultra-sensitive spring movement, these gauges register smallest readings . . . yet are durably built for long service. Turn out more tune-ups this fast, accurate way . . . with a Snap-on Tune-up Set. See your Snap-on salesman, or write . . .

SNAP-ON TOOLS CORPORATION
8036-I 28th Avenue • Kenosha, Wisconsin

Snap-on

The Choice of Better Mechanics

You can make a motor talk with this handy set



Save
ALUMINUM
by

KOETHERIZING
every
Pulled Piston!

FACTS ABOUT KOETHERIZING

There is only one genuine Koetherizing ! It is a patented process. There is no such thing as a "just the same" . . . no such thing as a "just as good."

WHAT KOETHERIZING DOES:

Koetherizing expands pistons accurately to within .001 of an inch.

Koetherizing resizes the piston permanently. Koetherized pistons will not collapse again.

Koetherizing makes all aluminum pistons "cam ground pistons."

Koetherizing is equally effective on either cast iron or aluminum pistons.

WHAT KOETHERIZING DOES NOT DO:

Koetherizing does *not* result in brittleness, or weaken the piston in any way.

Koetherizing does *not* create piston-boss distortion.

Koetherizing does *not* disturb piston-pin fit.

Koetherizing does *not* add weight to the piston.

Koetherizing does *not* "fall down" under engine heat.

KOPPERS COMPANY
AMERICAN HAMMERED PISTON RING DIV. • BALTIMORE, MD.

OIL

(Continued from page 40)

ring belt area, so that coking of the small amount of oil present results and ring functioning is often retarded or prevented.

The lubrication of a modern automotive engine is a complex matter and its satisfactory attainment requires a nice balance of several factors.

The oil must separate the moving parts by maintaining an unbroken film between them, thus preventing metal-to-metal contact, reducing wear and

the generation of excessive heat. It must cool the internal parts by flowing over them and carrying the heat away.

It must seal the piston in the cylinder against the passage of gas.

It should flush away dirt, metallic particles and oxidation products and carry them to the filter or sump.

And, especially important, it must resist the deterioration influences of the engine which tend to cause oxidation of some components of the oil with the formation of oxygenated materials which may interfere with lubrication and frequently are harmful to the engine.



"I can't find anything wrong with her. Are you sure it isn't the payments that are skipping?"

WHEN AN ARCO COLOR MACHINE COMES IN...

These **ENEMIES** of Paint Profits **GO OUT!**



1 NO TELEPHONING and waiting for out-of-stock colors or hard-to-match orphan shades. You make every color for every car—right in your own shop.

2 NO HAND-MIXING—with all its mess and guess work. It takes only 5 minutes to get a perfect match—with Arco's patented 3-alarm gauge.

[Add all this together and you get the difference between repainting with a PROFIT—and without. Reason enough why more than 4000 Arco Color Machines are in daily use throughout the world.]

THE ARCO COMPANY
Cleveland, Ohio Address Dept. M-9 Los Angeles

ARCO COLOR MACHINE

3 NO BIG INVENTORY—to tie up your money and your profits. Your very small investment keeps turning and earning. No obsolescence or deterioration.

4 NO MESSY LEFT OVERS—to waste away your profits. You make as small a quantity as you need and pay for it at gallon prices. A saving of 32c on every pint.




"Winter type oils," that is 10W and 20W oils, were devised to meet the problems of winter starting and operation and they have so successfully met these conditions that many consider them the most suitable and employ them for year-round crankcase lubricants in passenger car and some commercial vehicle operations. When the limitations of these oils are considered it will be appreciated that this practice under average operating conditions will tend to produce more rapid oil depreciation and shorten engine life.

It is a well-known and accepted fact that oils of S.A.E. 10W and 20W viscosity are more readily attacked by oxygen than are heavier grades. In the engine, at normal operating temperatures, the films provided by the lighter oils are thinner and thus more readily attacked by oxygen. Even with oils of high viscosity index, the light grades are more likely to fail under severe duty and high temperatures with the development of oxidation sludge, varnish, acidic and other harmful materials. Should the viscosity index of the oil be low, it is quite possible that at operating temperatures with high speed or heavy load the load carrying capacity of the oil may be so greatly impaired that the factor of safety is reduced and the mechanism endangered.

It is quite true that medium and heavy bodied oils increase the frictional drag in the engine, but at all temperatures except cold winter starting this increase is practically negligible having an average value of perhaps one mile decrease in top speed and an increase of 2 or 3 per cent in gasoline consumption.

It is true also that the heavier oils run slightly hotter in the engine. However, the increased temperature reduces viscosity somewhat so that

(Continued on page 74)



**YOU SAID IT, PAL! AND
IT'LL MEAN PLENTY OF
"GET-READY-FOR-WINTER
BUSINESS" FOR DEALERS
WHO USE P.S. TIE-INS.
AND NOW IS THE TIME
FOR EVERY DEALER TO
WRITE TO COLLIER'S AND
GET HIMSELF LINED UP!**

Collier's

Collier's P.S. Campaign is your salesman-at-large to the owners of a billion dollars' worth of motor cars!

P.S. means Preventive Service to Collier's readers. And it can mean Plenty of Sales to you. For Collier's helps car owners get more out of their cars—and *this means more service business!*

No other magazine is doing the tremendous job Collier's does, month after month, in

Collier's

selling *your* shop to car owners —millions of them! No matter what you, personally, do about it, some of your shop business is due to Collier's P.S. Campaign.

But get the most out of it by telling car owners you are "P.S. Headquarters"! Write a post-card that says: "I want to cash-in on P.S. — tell me how." And mail it—**TODAY** —to Preventive Service, Collier's, 250 Park Avenue, New York City.

P.S. campaign

OIL

(Continued from page 70)

under normal to severe operating conditions the actual difference in temperature between 10W and 20W and 30 S.A.E. oil is very slight.

These disadvantages of the medium and heavy oils are more than counter-balanced by the increased lubricating factor of safety which assures a continuous adequate protective film of oil to the engine parts under normal and severe operating conditions. The resistance to oxidation of the S.A.E. 30 and heavier oils is much greater under

all operating conditions and the oil consumption lower.

It has been suggested by some engineers and others that the close clearances employed in modern passenger car engines make medium and heavy oils unsuited for use in them. The closest fits employed in such engines currently are not less than 0.0005 inch. With normal "thick film" lubrication, oil films of 0.00001 to 0.0001 inch thickness are considered quite ample and adequate for safe lubrication. At engine operating temperatures, oils with viscosities of S.A.E. 30 and heavier will flow freely into the bearing clearances and provide a tougher

film with greater wear-resisting quality and a greater factor of safety in load carrying capacity.

It has been suggested also that, if an oil as viscous as S.A.E. 30 is employed for warm weather operation, the bearing clearances will be increased by wear to accommodate the thicker oil and that then an S.A.E. 10W or 20W cannot be satisfactorily used during the following winter season because of excessive oil consumption. The fallacy of such reasoning has been pointed out already and it is pertinent to point out here that, in considering oil film thickness, we are dealing with dimensions of the order of one-millionth up to possibly one ten-thousandth of an inch.

There is no intent to discount the light oils. They serve the purpose for which they were developed in a remarkably able way and have made possible winter starting and provide starting lubrication under the most severe conditions. But they were never designed to stand up in severe service at high temperatures. They oxidize more readily. Their load-carrying capacity may be dangerously low under severe operating conditions.

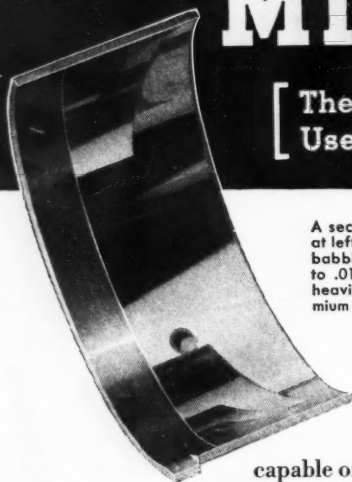
They have been oversold to the public and the fleet operator and many present-day lubricating troubles may be traced directly to the use of an oil which is of too light body at operating temperatures to stand up. The problems of oil oxidation in the engine are without doubt those which are responsible for the majority of present-day lubricating troubles and in many cases these problems can be reduced or eliminated by employing a grade of oil sufficiently viscous to better resist oxidation, to protect the bearings and provide an ample factor of safety.

It should not be inferred that the use of excessively heavy oils is advocated. An extreme in that direction would be as bad if not worse than the present situation. But it is suggested that, except for warm and hot weather operation where high speed or heavy loading or both make the service severe, an oil of S.A.E. 30 viscosity will assure better lubrication, provide an adequate factor of safety and more ably resist oxidation and the development of oxidized materials which may impair lubrication and injure the engine.

FOR 1941 REPLACEMENTS

THE NEW MONMOUTH MICRO BEARING

[The Same Bearing So Widely Used As Original Equipment]



A section of the bearing metal on the Monmouth Micro Bearing at left has been cut away from the steel back to show the thin babbitt lining—only .003 to .005 inch thick, as compared to .012 to .015 thickness in the conventional insert type bearing. The heavier steel strip used to back up the babbitt lining is of premium quality, held to a tolerance of .0005 inch on thickness.

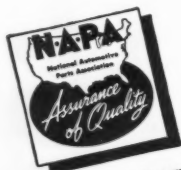
● The new Micro Bearings used in so many 1941 models have a capacity for punishment far beyond levels previously attained in production. They are capable of carrying greater loads, and their construction more than doubles fatigue life.

Yet even these bearings may fail through neglect or faulty lubrication.

When replacement is needed, be sure that your customers receive bearings of the same high quality, and the same fine construction used in the original motors.

Specify Monmouth MICRO Bearings—readily available through NAPA Warehouses and associated jobbers for servicing the cars and trucks using Micro Bearings as original equipment.

MONMOUTH PRODUCTS COMPANY, CLEVELAND, OHIO
ENGINE BEARINGS • CLUTCH PLATES AND PARTS • KING BOLT SETS



Master stocks of Monmouth Engine Bearings are maintained in NAPA Warehouses from coast to coast, assisting hundreds of jobbers in every section of the country to give prompt service even on rarely called-for numbers.

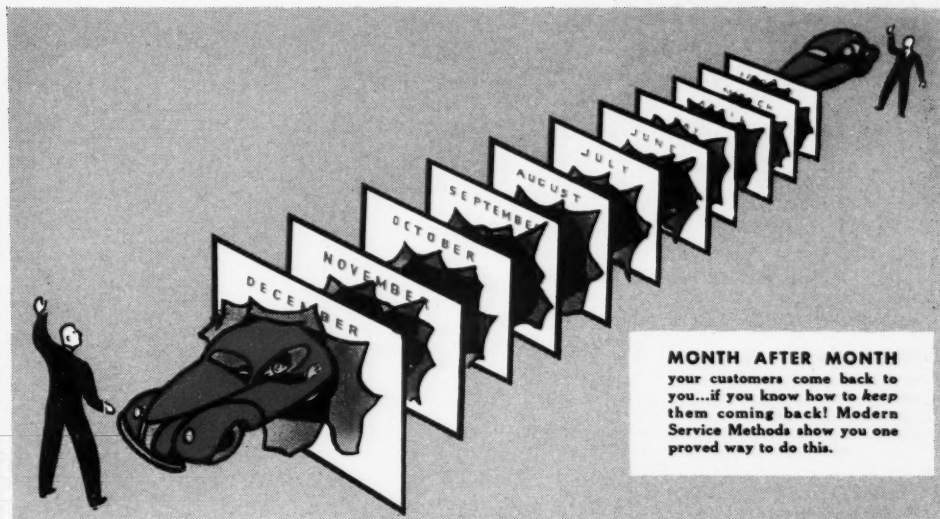
Monmouth

Is the Name!

OPM Order Stops Making of White Sidewall Tires

Manufacture of white-sidewall tires has been prohibited by OPM to conserve rubber and zinc. This order, which became effective Aug. 23, followed an earlier order reducing production for civilian use, and is expected to save 6000 tons of crude rubber a year. Two pounds more per tire are required in making white sidewalls. The zinc used is in the form of zinc oxide to color the rubber.

**WITH
MODERN
SERVICE
METHODS
YOU CAN...**



Keep 'em Coming Back For More!

REPEAT BUSINESS—that's the money-maker! And you know it as well as we do. Now, with Modern Service Methods we can show you one Proved Successful Way to go after—and get—those profitable "repeat" customers. We have trained Specialists ready to personally coach your entire Staff!

QUICK FACTS ON "MODERN SERVICE METHODS":

- 1 UNIQUE TRAINING COURSE—** Everyone in your organization is trained in Modern Service Methods. This sales coaching program is conducted by trained Socony-Vacuum specialists. It includes instruction with movies, slide films, charts and service manuals.
- 2 YOUR MARKET IS CAREFULLY SURVEYED** to calculate the future growth of your business.
- 3 YOUR PRESENT LAYOUT IS STUDIED**—We suggest improvements

in your equipment and in the arrangement of your establishment. We recommend the type and size lubricatorium your business will require.

- 4 SALES PROMOTION**—We offer hard-hitting sales promotion pieces to push your service specials... bring new customers into your place.

SOCONY-VACUUM OIL CO., INC., and Affiliates—Magnolia Petroleum Company, General Petroleum Corporation of California.



ADDRESS CAR DEALER DIVISION—SOCONY-VACUUM OIL CO., INC., 26 BROADWAY, N. Y. C.

Socony-Vacuum

MAKERS OF MOBIL OIL AND MOBIL GREASE

SERVICE BOOM

(Continued from page 33)

Originally, the spacious front section of the building was designed, with the exception of two lifts and spotless lubrication equipment in a far corner, to provide space for new cars. Beyond a partition was to be a repair shop, and at the end of the building a body and fender shop.

As things have turned out, little space is left for new cars. This huge space now houses all the testing equipment and one wall is lined with me-

chanics' benches where all the tune-up work is done. To all intents and purposes, the sales room has been transformed into a service shop.

A few new cars, when they can be obtained, are kept along one wall, and one of the extensions at the front of the building provides office space for the car salesmen, but these things, except for the used cars parked on the space in front of the building are the only concessions to car-selling.

The repair shop contains the most modern equipment and a number of touches that make it exceptional. Six ducts have been built into the floor to carry off exhaust gases, and steel

rings, used in straightening frames, have been sunk into the floor. As a help in following up the progress of work, a call system, providing loud speakers at frequent intervals throughout the shop, has been installed. Along one side of the shop runs a rough road on which mechanics test cars for squeaks and rattles.

In moving to a new location, Fetter was never troubled by the tradition that customers are loath to follow a business. Results have more than justified his boldness. In the two years since the new shop was opened, service business has increased five times. For the first 20 days of July this year, it amounted to \$1,900 in labor sales alone.

Some of the volume comes from the Pennsylvania Turnpike, the eastern terminus of which is located just east of Carlisle. The Seven Star Garage is the official service station for the first section of the super highway. This distinction requires a 24-hour patrol of that section of the highway by a fully equipped service car. That is no particular chore for this shop, as it offers 24-hour service anyway.

And, when Fetter's shop offers service, it means complete service. It is equipped for every conceivable job except generator work and crankshaft turning. Generators are sent to a jobber and, when there is a crankshaft to be turned down, the jobber comes out with his portable equipment.

If the shortage of new cars becomes acute, or even if the supply dries up entirely, the Seven Star Garage is going to feel the effects as little as any car dealership in the country. It is ready for the service boom.

AMERICA'S BEST MECHANICS STOCK P. & D. PARTS AT ALL TIMES

Do as the leaders do. Keep

P. & D. parts always on hand.

Be in a position to take care

of any repair or tune-up job

that comes into your shop.

Call your Jobber today.

YOU NEED THIS FREE BOOK

64 pages packed with illustrations, specifications and information that make it easy to choose the right part for Starting, Lighting, Ignition replacement jobs. The most complete information on these subjects ever collected in one book.

Write for your copy today.



GENUINE P. & D. IGNITION PARTS

P. & D. MANUFACTURING COMPANY, Inc.
STARTING LIGHTING IGNITION REPLACEMENT PARTS
LONG ISLAND CITY NEW YORK

P. & D. Manufactures ONE complete quality line. Only the finest materials and workmanship obtainable are employed.
YOU CAN NOT PURCHASE ANY FINER QUALITY

BATTERIES

(Continued from page 28)

building up an unusual battery business:

1. Handle only first-line batteries.
2. Test batteries with a volt meter as well as a hydrometer.
3. Start selling a new battery the minute you find the old one has a weak or dead cell.

The reason behind the first rule is obvious. First-line units carry a fair discount, and, because they are dependable, the man who sells them is relieved of the trouble and expense of taking care of come-backs.

Testing batteries with a volt meter is standard practice in hundreds of shops but there are probably as many that still depend on only the hydrometer test. Spangler used to work in a shop that did not have a volt meter. "And we lost sale after sale," he says. "I don't know exactly why a customer is more impressed by a meter than he is by a hydrometer. But he is. I

(Continued on page 83)

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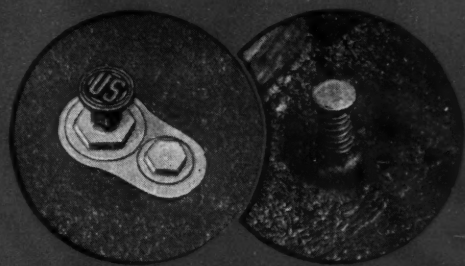


Superiority in Design and Construction Means Supremacy in Action...

FROM the tip of the cylinder to the top of the runways, U. S. "Tailor Made" Lifts are built for top flight performance, economy of operation, safety, speed and long life. Yet they're not high priced. Streamlined for strength, accessibility, they boast of exclusive features found in no other lift. U. S. crossheads (only 18" wide) are stronger, being stamped out of 1/2" thick steel plate and much narrower than most other lifts. This feature alone means more strength, safety, better visibility and accessibility. The remarkable patented U. S. foot valve junction manifold, which sets flush with the floor is a revelation, eliminating numerous pipe fittings and the usual hole around valve which acts as a catch basin for dirt, oil and grime. Quick and easy access, to all valve parts by simply loosening nut without breaking or bending any joints in the pipe line. This exclusive U. S. junction manifold actually saves air consumption and enables the lift to raise heavier loads with less effort. Before you buy a lift send for free catalog and see for yourself why U. S. "Tailor Made" full hydraulic lifts are the choice of both major companies and independent operators.



THE UNITED STATES AIR COMPRESSOR COMPANY · CLEVELAND, OHIO
AIR COMPRESSORS · GREASING EQUIPMENT · HYDRAULIC LIFTS

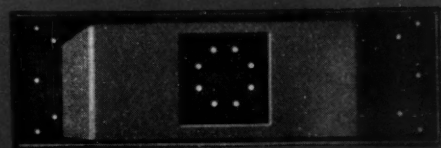


U. S. Foot Valve sets flush with floor, clean at all times. Quick and easy accessibility to all valve parts.

Ordinary Foot Valve with hole around valve acts as catch basin for oil, water, grease and dirt.



"Tailor Made" streamline U. S. Crosshead, narrower but stronger.



Underneath view of U. S. Crosshead showing rigid box construction.



It looks like a
**LONG, COLD
WINTER**

**... that's my
tale and I'm
sticking to it!**

TAKE it from the squirrel, mister—what you want this winter is *protection*.

Protection for your customers' engines, against the wear-and-tear of cold weather driving.

Protection for your profits, too.

With Wolf's Head you get both. The positively controlled fluidity of Wolf's Head Winter Oil means instant lubrication, the moment the engine turns over. As one indication of quality, Wolf's Head *guarantees the car-buyer against repair bills on lubricated parts during the first 30,000 miles.*

Winter and summer alike, the Wolf's Head Guarantee Plan is your best help in closing new car sales, as well as in bringing customers back for regular service—and regular service is more vital today than ever before. If you haven't already received full information about the Wolf's Head Guarantee, write now to Wolf's Head Oil Refining Co. at Oil City, Pa., or New York, N. Y.

WOLF'S HEAD
Winter
MOTOR OIL AND LUBES



P. G. C. O. A.
Permit No. 19
100%
Pennsylvania

BEARINGS

(Continued from page 27)

To return to the subject of the engine bearings, some of the failures have been directly attributable to insufficient oil in the crankcase, the owner having failed to realize that oil is consumed very rapidly at high speeds. However, that condition seems to have occurred in only a limited number of cases. Some mechanics state that, while there has been an adequate supply of oil, appearance of the bearings would indicate that the failure was due to insufficient oil reaching the bearings. Since the oil passages have been clear, it would seem that in some cases at least, the trouble would be caused by oil being pocketed in the passageways. In addition, there is the possibility of the failures being caused by oil of inferior quality or of too low a viscosity for high-speed driving. But, regardless of the cause, all repair men should warn their customers to take every precaution before driving at high speeds for prolonged periods.

BODY ALINING

(Continued from page 35)

section. Before the job is passed as complete, it is well to go back over the entire structure to be sure that all measurements check.

In some cases, it is easier to straighten the body if some of the welded joints are broken. This can be done either by drilling out the spot welds or carefully chipping the welds with a chisel. When the structure is in line, all welded joints should be inspected and any that have been broken either intentionally or as a result of the bending process should be re-welded. The use of heat to aid in bringing the body structure back into line should be avoided.

BATTERIES

(Continued from page 78)

think my volt meter does more than anything else to sell new batteries."

In reality, it is hardly more potent than starting to sell a new one as soon as the meter shows the old battery to be defective. Cost is an important point in convincing the customer.

Spangler points out that charging the old battery, either with his fast charger or by putting it on the line, will cost the customer \$1.25 and that rental on a service battery will cost

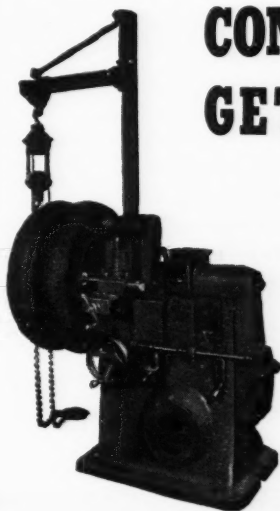
\$1 more. This \$2.25 will be in addition to the cost of a new battery because, as he can truthfully tell the customer, the old one will fail quickly even after being recharged.

The thing Spangler is trying to avoid, of course, is having the customer order his recharged battery returned to the car and then buy a battery somewhere else when the old unit quits again. His record of sales shows he succeeds more often than he fails.

Recently Spangler added a fast charger to his equipment. Although

he has used it only during warm weather, when demands for battery service are at their low, the device has already demonstrated its value in eliminating the labor of taking batteries out of cars and replacing them, and in dispensing with rental units.

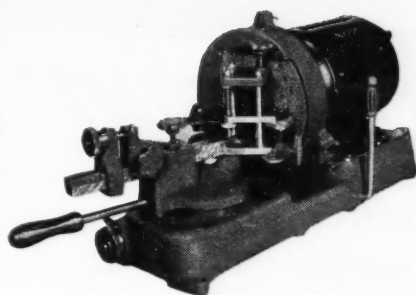
Thus Spangler is equipped to take full advantage of battery sales and service when the winter rolls around again. He is not worrying about the fact that his methods are being used by far larger shops in far more populous areas than his. The important thing is that they pay him dividends.



COMPLETE BRAKE SERVICE GETS ALL THE JOBS!

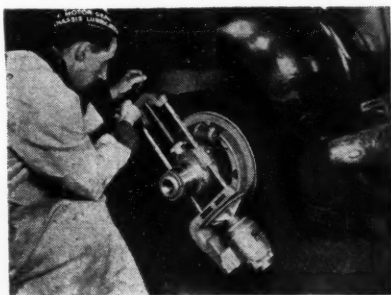
BRAKE DRUM TRUING

Brake drum truing is one of the most profitable of all automotive shop operations. Lempco makes a complete line of brake drum lathes to choose from. With eleven different models there's a size and price for every shop. Instead of paying outside shops for this work, install a Lempco Brake Drum Lathe **now** and cash in on this profitable operation.



BRAKE SHOE GRINDING

For production brake shoe grinding the Lempco machines are the best on the market. With a Junior or Senior Model — depending on the variety of your work — you can grind all shoes and give a faster, better relined job.



BRAKE PERFECTING

Grind the lining on the car with a Lempco Brake Perfector and the brakes are right when the car rolls out of your shop. It eliminates comebacks for free adjustments because the lining is ground to fit the contour of the drum perfectly.

Write Today for Catalogs

Send catalogs and complete information on ☐ Brake Drum Lathes ☐ Brake Perfector ☐ Brake Shoe Grinders

Name

Address

City State

LEMPCO PRODUCTS, Inc.
BEDFORD, OHIO

New Manual Published

On Machine Shop Practice

Mechanics and men anxious to enter the machine shop field will find the New Encyclopedia of Machine Shop Practice a valuable text book from which to learn the fundamentals of machine shop practice and the operation of various types of machines. Containing 576 pages and nearly 1000 illustrations and diagrams, the manual covers such subjects as lathe and milling machine operation, gear cutting, heat treatments, forge and foundry work, and includes an up-to-the-minute discussion of the new metal

alloys and their uses. The manual is edited by Prof. George W. Barnwell, of Stevens Institute of Technology, and is published by Wm. H. Wise & Co., New York City. Price \$1.98.

Barrett Equipment Expands

Ground was broken recently by the Barrett Equipment Co., St. Louis, Mo., manufacturers of precision built brake service tools and equipment, for the expansion of plant No. 1. This addition will give the company 9000 additional sq. ft. in plant No. 1. An additional 15,000 sq. ft. of floor space are also being added to plant No. 2.



LINK-BELT

SHAFFER

ROLLER BEARINGS

FOR FRONT WHEELS, DIFFERENTIALS AND REAR AXLES



YOU buy a bearing first on its rolling qualities and secondly by its wearing ability. This Link-Belt roller bearing excels in both by a tremendous margin. Why? . . . Because it is built on an exclusive principle—with concave rollers and convex raceways—which assures smoother action for longer mileage. Prove this better performance yourself by replacing the bearings in your next job with Link-Belt. Your jobber will supply you!

8576

LINK-BELT COMPANY

519 N. Holmes Ave., Indianapolis, Ind. Warehouses in all principal trading centers
Made by the makers of the famous Silverstreak Silent Timing Chain!



"Do you carry insurance? I mean life insurance."

Stathas Named President

by Wisconsin Dealers

James Stathas, Green Bay, Wis., was elected president of the Wisconsin Automotive Trades Association, at the annual convention of the group at Green Bay, Aug. 20-21. He succeeds George E. Sande of Neenah. Other officers elected were Ervin Benning, Kenosha, and E. A. Fritsch, Manitowoc, vice presidents; J. Fisher, Manitowoc, secretary-treasurer. For the past year Stathas has served as the organization's first vice-president, and had represented Brown and Oconto counties of the board of directors.

The two-day program included group meetings of four divisions of the association — Chrysler, General Motors, Ford and independent dealers. Speakers were R. Clare Cargile, Texarkana, Ark., president of the NADA; L. S. Snow, national vice president; Edward Payton, Cleveland, and William C. Cowling, Detroit, Mich.

Membership Increases

According to A. H. Eichholz, general manager of the Motor and Equipment Manufacturers Association, nine more manufacturers of automotive products have become affiliated with MEMA as members and 14 as credit subscribers.

The names of the new members since previous reports are as follows: Aurora Equipment Co., Aurora, Ill.; Dupli-Color Products Co., Inc., Chicago, Ill.; Eagle-Picher Sales Co., Cincinnati, Ohio; Service Supply Co., Denver, Colo.; Tung-Sol Lamp Works, Inc., Newark, N. J.; Utica Drop Forge & Tool Corp., Utica, N. Y.; Waverly Petroleum Products Co., Philadelphia, Pa.; Wausau Motor Parts Co., Wausau, Wis.; Willard Storage Battery Co., Cleveland, Ohio.



NOW ORIGINAL EQUIPMENT
ON THE FOLLOWING PLANES:

BELLANCA	PIPER
CULVER	STINSON
ERCOUPE	WACO
LUSCOMBE	AND OTHERS

New!

**Super Brake Fluid
for Aircraft and Heavy
Duty Automotive Service**



AGAIN PURITAN LEADS IN THE FIELD OF HYDRAULICS

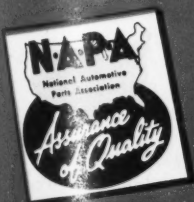


Most significant since the announcement of the first "all miscible" brake fluid—still an exclusive Puritan feature—comes the sensational news that Puritan's new, improved Super grade fluid is now standard equipment on all leading airplanes using rubber sealed hydraulic brakes. Why? Because it is the only fluid engineered to meet the severely rigid safety standards of the aircraft industry—vaporization point over 100°F higher than any standard fluid on the market, absolute safety with rubber, non-gumming, absorption of condensation, *complete* miscibility with other fluids when used for refill. *And at no advance in Price!* ★ Puritan Co., Inc., Rochester, N. Y.

Give yourself and your customers the unique advantages of this premium-quality product. See your N.A.P.A. Jobber.

Only PURITAN Has These Features

- ★ Patented, non-gumming base—avoids oxidizing tendency of castor oil.
- ★ Complete miscibility. Mixes with any and all other fluids, "standard" or "gyp"; absorbs moisture of condensation, thereby removing corrosion hazard.
- ★ Passive to rubber. Comparative tests show rubber to change less in presence of Puritan than any other fluid on the market; certified by prominent rubber experts and independent laboratories.
- ★ Non-volatile. Composed 100% of materials boiling over 350°F. Initial boiling point nearly 100°F higher than any other fluid.
- ★ Lowest freezing point of any heavy duty fluid on the market.



PURITAN
Super

AIRCRAFT QUALITY BRAKE FLUID

Perfect Circle Ring Sales Break All-Time Record

In the first six months of 1941, 54,968,685 Perfect Circle piston rings were manufactured and sold, establishing a new all time sales record. This new figure beats the old 1940 first six months' record by 16,247,685 rings, the company announces.

All four Perfect Circle plants in Hagerstown, New Castle, Tipton, Ind., and Toronto, Canada, are a beehive of activity these days. Perfect Circle employment is at a new all time high with 1600 on the payroll. Practically

all manufacturing divisions are working on a three-shift basis with the exception of the aviation division which is on a four-shift basis.

Wittek Expands

The Wittek Manufacturing Co., Chicago, manufacturers of NOC-OUT hose clamps for the past 20 years, is making its second increase in plant facilities since the first of the year. According to B. A. Tetzlaff, president, the new edition, adjacent to the present address, will be an increase of 10,000 sq. ft. of floor space.

Labert St. Clair Engaged by Dealers Association

Appointment by the National Automobile Dealers Association of Labert St. Clair, of Washington, as executive assistant to the organization, is announced. He will be attached to the Washington office of the association.

St. Clair has had extended experience in Washington and enjoys a wide and intimate acquaintance among government officials, members of Congress, newspaper men and others active in public life. Originally a political writer for the Associated Press working out of Chicago, he joined a Congressman for a year to learn Washington from behind the scenes. Later he was chief of staff for the Associated Press in the House. He resigned to conduct his own business counseling agency in Washington and New York and has at various times since been drafted by the government to do emergency promotional jobs.

He helped launch four Liberty Loan drives, aided in organizing Federal Housing Administration publicity section and assisted in laying the groundwork for the unemployment census of 1937, headed by John D. Biggers, now of OPM. As transportation assistant to Secretary of Commerce Daniel C. Roper, he handled many of the Secretary's Congressional and departmental contacts.

Shifted To Dallas

Appointment of O. V. Chapman as manager of the Dallas branch of Reo Motors, Inc., has been announced by E. R. Kroblen, Reo general sales manager. A Reo veteran of more than 12 years, Chapman started with Reo's Birmingham branch in 1927, was transferred to Atlanta in 1933 and to Kansas City in 1936. Leaving Kansas City in April, 1939, he returned to Birmingham to look after personal interests and has now rejoined Reo as head of the Dallas branch.

Return of Herman Dorn to his former position as manager of the Milwaukee branch, after temporary management of the Dallas branch for the past few months, was also announced by General Sales Manager Kroblen.

Makes Field Survey

Recently promoted from territorial sales work to a position as special representative of the Plomb Tool Co., Glenn Crandall, is making a field survey trip by air to cover all principal cities in the country. The survey is expected to take approximately six weeks and is for the purpose of studying marketing conditions in the various territories to facilitate improved service for Plomb Tool jobbers and users.

**Cut
Large,
Clean,**

**Round
Holes
in
Seconds**

VAN DORN'S DRILL and HOLE SAW cutting combination is the greatest work saver in any man's tool kit! Driven by a Van Dorn Electric Drill of proper capacity, Van Dorn Hole Saws quickly and easily cut round holes from $\frac{5}{8}$ " up to 4" diameter—ranging over 24 different sizes. Use Van Dorn Hole Saws for cutting openings for heaters, radios, clocks or installing "fresh air" systems. Just the tool you need to speed up installing modern equipment on used cars. Hole Saws cut anything a hack saw will cut—without the "elbow grease". Ask your jobber for a demonstration or write Van Dorn Electric Tools, 727 Joppa Road, Towson, Md.



**VAN DORN
 $\frac{1}{2}$ " UTILITY DRILL**

—one of the 30 powerful, fast Van Dorn Electric Drill models for automotive use. No matter what your drilling requirements are, VAN DORN DRILLS are your best buy for best work.

"Van Dorn"

(DIV. OF BLACK & DECKER MFG. CO.)

THE "RED HEADED" PORTABLE ELECTRIC TOOLS

this is a Horse of a DIFFERENT COLOR!

It's a Fact!

The weight of this 1500 lb. horse was lifted with a Thermodized Pre-Stretched Fan Belt which had been taken out of actual service in a car. After the test, the fan belt was reinstalled and performed perfectly with absolutely no change in adjustment.



Thermodized
PRE-STRETCHED

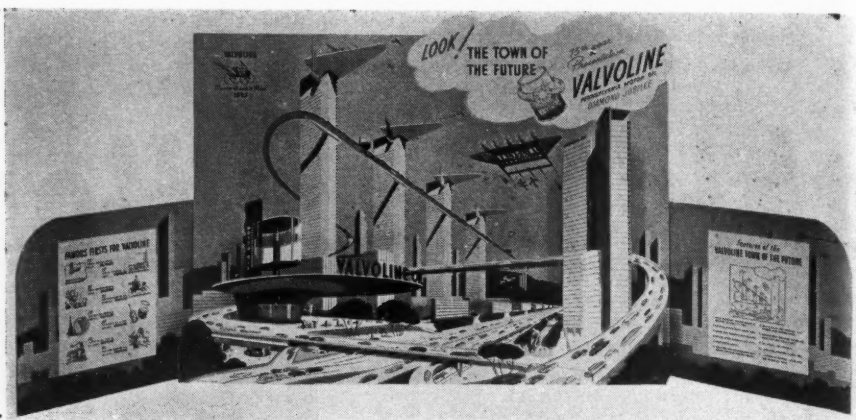
FAN BELTS

THERMOID COMPANY • TRENTON, NEW JERSEY

SEPTEMBER, 1941

When writing to advertisers please mention Motor Age

In celebration of its Diamond Jubilee, the Valvoline Oil Co., Cincinnati, Ohio, has produced this unusual window display. The display depicts the Town of the Future. Features of the town are Super Valvoline station capable of servicing 100 cars at a time; colored glass and plastic office buildings; vari-level streets to eliminate cross traffic; landing fields atop buildings; Valvoline flying lubrication for servicing rocket ships and strato planes; lower level pedestrian shopping area.



"How Much Is A Customer Worth To YOU...?"

FEL-PRO Gasket Sets. A complete line... many types of materials for every job.

FEL-PRO Pump Packing. Fits flush at once... makes installation faster and easier.

FEL-PRO Grease Retainers. Easily installed...no special fitting...accurate on all cars.

"Every one of your customers is worth plenty to you in volume and profits! In order to hold their business and build up goodwill you have to show them your work is THE BEST from start to finish.

"We get these profit making advantages in our shop by using FREE Fel-Pro display panels. Here's how it works when I'm selling a motor service job.

"I reach over to the Fel-Pro display panel and say, 'Here's one reason our motor service work is better—Notice the alternate layers of sheet aluminum, asbestos and wire mesh in this Fel-Pro Alupak gasket. It's tough, pliable enough to seal rough surfaces and is impregnated with a patented, heat-proof compound that expands under heat and assures a perfect seal. We use them on every motor job... that's one reason you can be sure of your motor performance even at highest temperatures and compression.'

"Man, it sure helps sell shop service jobs!"

Write Now for Details on These FREE Displays and New Catalog or See Your Jobber Today!

FELT PRODUCTS MFG. CO., 1510 W. Carroll Ave., Chicago



Hastings Publishes Book on Vital Role of Cars

Feeling that the time was ripe for dissemination of some facts about the utility of the passenger cars, trucks and tractors this nation already has at work in "all out defense," Hastings Manufacturing Co., has issued a unique book, "Convoys on Wheels—A Discussion of the Vital Importance of Automotive Jobbers in National Defense." The book brings to light just how closely and effectively our present motorized mode of life is integrated into the preparedness program.

So much publicity has been released on production cuts of new cars and little attention has been paid by the public to the 27,000,000 registered passenger cars, 4,500,000 trucks and nearly 2,000,000 tractors that are the heart and sinew of this nation. We might be able to get along even though we are unable to produce as many new cars, if we have the parts, accessories and equipment, which will enable us to keep those we now have running, Hastings avers.

Joins Mack Motor

Palmer E. Hanson, for the past 12 years secretary of the Milwaukee (Wis.) Automotive Trades, Inc., and who has managed the annual Milwaukee Automobile Show, has become associated as assistant to the works manager of Mack Motor Co., in Brunswick, N. J. He will be active in the truck concern's foundry department.

Hansen has been identified with the automotive field for many years, having headed his own firm, and before coming to Milwaukee, being superintendent of the Buick Motor Co. foundries in Flint. Subsequently he was employed by the Lackie Foundry at Muskegon, Mich.

Made Regional Chief

Effective Sept. 1 S. A. Harris has been appointed eastern regional manager of the Detroit Rex Products Co. W. F. Newbery, formerly eastern regional manager, has been promoted to the general office at Detroit on special duties.

**YOU
NEED STOCK
ONLY ONE FLUID
- LOCKHEED
21**



WAGNER LOCKHEED No. 21 HYDRAULIC BRAKE FLUID *is an all-weather, year-round fluid for all cars and trucks*

NO. 21 is unqualifiedly recommended for *all* hydraulic brake systems. There is none better at any price.

It will pay you to stock and feature this super quality product. It is the best known, most universally accepted, and most extensively advertised brake fluid on the market.

Only No. 21 Has ALL These Advantages

1. One mixture for all seasons . . . Reduces inventory.
2. One mixture for all cars and trucks . . . Reduces inventory.
3. Assures year-round operating performance.
4. Functions in sub-zero temperatures.
5. Amply lubricates the system over the operating range of temperature.
6. Maintains chemical characteristics after long use.
7. Maintains its high operating temperature characteristics.
8. Mixes with other approved fluids.
9. A proven product . . . Used by car manufacturers.
10. Nationally advertised . . . Has consumer acceptance.
11. Warehoused throughout the United States and Canada at 25 Wagner branches.
12. Packaged in five sizes of containers: 5-gallon, 1-gallon, quart, pint, and 3-ounce.
13. A product of Wagner Electric Corporation, manufacturers of Lockheed Hydraulic Brakes.
14. Available everywhere through leading jobbers.

WHEEL AND MASTER CYLINDER REPAIR KIT MERCHANDISER

This ready-for-use Repair Kit Merchandiser (FL-332) contains an assortment of 31 Master and Wheel Cylinder Repair Kits for servicing Ford, Chevrolet, Plymouth, and many other cars. Write for complete information:



STOP-LITE SWITCH MERCHANDISER



This Wagner Lockheed Stop-Lite Switch Merchandiser (FL-334) will increase your profits—it brings to the attention of the motorist an important item that has been given little thought. Consists of 20 switches to service all popular makes of passenger cars, trucks, trailers, and buses.

Clip and Mail This Coupon Today!

Wagner Electric Corporation

6400 Plymouth Ave., St. Louis, Mo., U. S. A.

- Send details and prices on No. 21 Fluid . . . on
— Wheel and Master Cylinder Repair Kits . . . and on
— Stop-Lite Switch Merchandiser.

Name and Position

Firm

City and State

I Buy My Parts From

Tire Retreaders Seek

Priorities on Material

At the joint meeting of the board of directors of the National Association of Independent Tire Dealers held in Chicago, it was decided Executive Director Cliff Simpson should devote his energies to securing a priority rating for the treading industry.

After arriving in Washington and making contacts with prominent men of OPM and OPACS, Simpson called a two-day conference of special committees to represent mold and equipment manufacturers, camelback manufacturers, and treading shop opera-

tors. As a result of these conferences a joint committee was organized to represent the three groups. This committee is Cliff C. Simpson, chairman; Charles H. Brown of the Super Mold Corp.; James C. Heintz of the James C. Heintz Co.; Griffith Oliver of the Oliver Tire and Rubber Co.; Ralph Smith of the Webster Rubber Co.; Albert Rose, a treader of Nashville; and William Hickey, a treader of Hartford.

A special committee of treaders has been appointed to work with Cliff Simpson on matters pertaining to expanding the National Institute on a national basis. This committee is

Dave Lehman, chairman, Washington, D. C.; Albert Rose, Nashville; William Hickey, Hartford; James Bradburn, Philadelphia; C. E. Erdman, Baltimore; Bryan Chace, Birmingham; Ralph Robinson, Minneapolis; and Ira Shull, Los Angeles.

U. S. Rubber Promotes

Tire Sales Executives

H. N. Hawkes, who was recently made general sales manager of United States Rubber Co.'s tire division in charge of all tire sales, has announced the following appointments in his organization:

H. E. Malcomb has been made assistant to Hawkes. Malcomb had been manager of the special purpose tire department.

R. P. F. Liddell has been placed in charge of the airplane tire activities of the company. He had been acting as special assistant to Hawkes.

A. B. Fennell has been named sales manager, and R. E. Hedlund assistant sales manager in the U. S. Tire division.

J. C. Ray becomes sales manager, and H. M. Ramsey assistant sales manager in the Fisk tire division.

W. D. Baldwin becomes assistant sales manager in the jobber tire sales division.

H. C. McDermott, formerly general sales manager of the Fisk tire division, has been appointed eastern divisional sales manager with headquarters in New York City, and C. W. Ort now becomes southern divisional sales manager located in Memphis, Tenn.

Gubb Named Chairman of Philco Corp. Board

Election of Larry E. Gubb, former executive vice-president, to the office of chairman of the board of Philco Corp. has been announced. Several other promotions also were announced. John Ballantyne, former treasurer, was elected vice-president in charge of operations; Thomas A. Kennally, formerly general sales manager, was named vice-president in charge of sales; W. R. Wilson, controller, succeeded Ballantyne as treasurer; and James H. Carmine, former assistant general sales manager, became general sales manager.

James T. Buckley, who has been president of Philco since 1939, will continue in that office.

Perfect Circle Dividend

The directors of The Perfect Circle Co., declared the regular quarterly dividend of 50 cents per share on the 162,500 shares of outstanding capital stock of the company on Aug. 20. The dividend is payable Oct. 1, 1941, to stock of record at the close of business Sept. 17, 1941.

Sam HALLOWELL

... it's the SHOP FURNITURE *You Need*

● Hundreds of automotive service and repair shops can't be wrong... and they're all installing "Hallowell" equipment — Benches, Tool Stands and Foremen's Desks.

They find in the "Hallowell" exceptional sturdiness, rigidity, smart appearance, standardized and interchangeable parts, a wide range of styles and models, lower than anticipated costs!

Investigate "Hallowell" advantages today!

A note on your letterhead brings free bulletins. Write—

STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNA. BOX 561

BOSTON • DETROIT • INDIANAPOLIS • CHICAGO • ST. LOUIS • SAN FRANCISCO



Fig. 1729

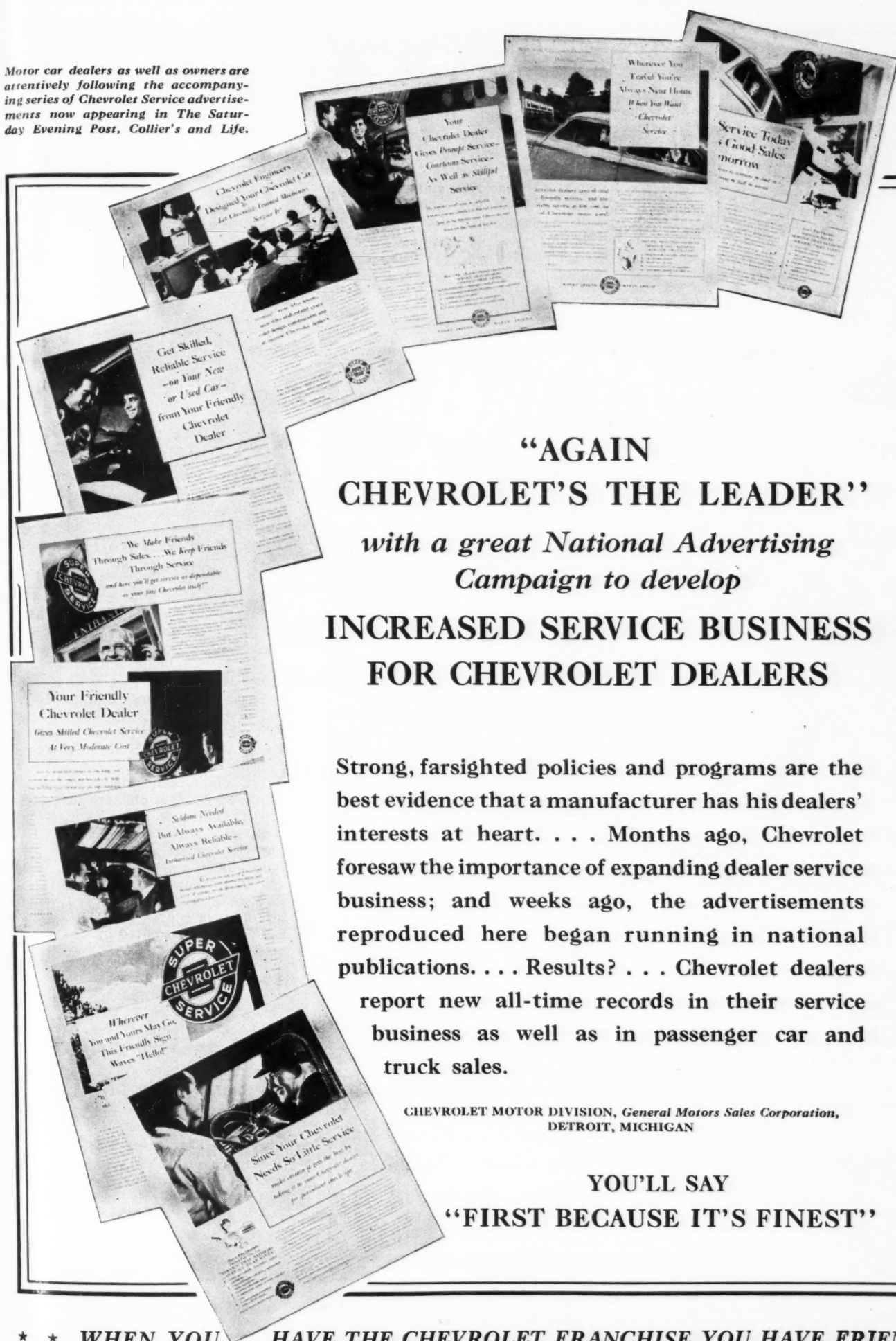
DE LUXE "Hallowell" Bench. It's one of 1367 styles and models.



Fig. 928

Bench with all laminated wood top.

Motor car dealers as well as owners are attentively following the accompanying series of Chevrolet Service advertisements now appearing in The Saturday Evening Post, Collier's and Life.



"AGAIN CHEVROLET'S THE LEADER" *with a great National Advertising Campaign to develop INCREASED SERVICE BUSINESS FOR CHEVROLET DEALERS*

Strong, farsighted policies and programs are the best evidence that a manufacturer has his dealers' interests at heart. . . . Months ago, Chevrolet foresaw the importance of expanding dealer service business; and weeks ago, the advertisements reproduced here began running in national publications. . . . Results? . . . Chevrolet dealers report new all-time records in their service business as well as in passenger car and truck sales.

CHEVROLET MOTOR DIVISION, General Motors Sales Corporation,
DETROIT, MICHIGAN

**YOU'LL SAY
"FIRST BECAUSE IT'S FINEST"**

★ ★ WHEN YOU HAVE THE CHEVROLET FRANCHISE YOU HAVE FRIENDS

SEPTEMBER, 1941

When writing to advertisers please mention Motor Age

Edison-Splitdorf Launches 'Save the Gas' Campaign

Edison-Splitdorf Corp., West Orange, N. J., announces a fall sales promotion campaign based on a "Save the Gas" theme, perhaps the first company in its field to pioneer tying in with government pleas to the motoring public to conserve the use of gas. The campaign is designed in its entirety to make the public, as well as retailers of spark plugs, conscious of the important part plugs play in the conservation of gasoline, through regular inspection, cleaning, adjustment and replacement.

The springboard for the national "Save the Gas" program will be a complete campaign package together with instructions for use, placed in the hands of Edison-Splitdorf jobbers, dealers and salesmen, for the use of salesmen in contacting retail outlets.

The plan to flood the country, in cooperation with the Government, with this material, calls for the display of a banner, primarily at gas station pumps and carrying the "Save the Gas" slogan. Banners have been so designed as to serve as either an interior or exterior display piece at other automotive outlets.



See How This Star Performer Can Increase Your Profits

With PennZoil you sell more than a promise, more than an experiment. You sell quality—quality proved before today's PennZoil was put on the market—and proved since its introduction by experts who specify PennZoil for some of the world's toughest lubrication jobs!

PennZoil's proved ability to lubricate better and last longer keeps enthusiastic users coming back to you for service, insures repeat business. Let this top Pennsylvania oil—and the pre-tested sales plans behind it—work for you. Mail coupon today!

CALLING MR. MAILMAN! Take this to The Pennzoil Co., Oil City, Pa., and tell 'em I want honest-to-Andy dope on how to:

- | | |
|--|--|
| <input type="checkbox"/> Bring inactive customers back | <input type="checkbox"/> Sell 'em more when they're in |
| <input type="checkbox"/> Stop complaints on quality | <input type="checkbox"/> Increase tire and accessory sales |
| <input type="checkbox"/> Get customers in oftener | <input type="checkbox"/> Doll up the shop (pretty cheaply) |

NAME _____ TITLE _____
FIRM _____
STREET _____
CITY _____ STATE _____

MA-4



"Dugan used to be an advertising man."

Goodyear Will Build Plane Parts Factory

A step toward further decentralization of America's program for the production of vital defense materials was seen today in the announcement by P. W. Litchfield, chairman of the board of Goodyear Tire & Rubber Co., that a Goodyear subsidiary shortly will erect a large plant for the manufacture of airplane parts at Litchfield Park, Ariz., which is 15 miles west of Phoenix.

The plant, which is to require an initial investment of more than \$500,000 exclusive of equipment, will be strategically located to serve the aviation production centers of the West Coast and Texas. It is well inland and thus protected against any possible air attack. Also it is in the center of a vast area whose population has not been benefited by the current industrial defense boom. It will be the first large defense industry in that section.

Col. John Adam Smith

Col. John Adam Smith, founder of The United States Electrical Tool Co., Cincinnati, Ohio, died July 24, at the home of his daughter, Mrs. Mercedes Lawrence, Cincinnati. He was born 76 years ago in New Richmond, Ohio, and exhibited an early aptitude for electrical engineering. He was superintendent of the old Main street transportation road in Cincinnati, developed the first street car heaters, installed the first circuit breaker and ran the first street car sprinkler.

He founded the United States Electrical Tool Co. in 1897. Four sons and two daughters survive him.

KEEP THEM RUNNING AMERICA!

FEWER people will buy new cars
...more people will be driving their
old cars for the next year.

That means **SERVICE** ... probably
more than ever before ... to keep
the vital wheels of automotive
transportation running.

That means **Equipment**, too
... more and modern equip-

ment of every kind for your shop,
so that you can handle your share
of the business and take in your
share of the profits.

The longer you delay the harder it may
be to get the equipment you
need, so, See Your Jobber **NOW**
and buy on the **AUTOMOTIVE
EQUIPMENT PLAN**.

**INSURANCE
INCLUDED**



CASH FOR YOU ... TIME FOR YOUR CUSTOMERS

You'll get bigger and more profitable repair
jobs if you offer your customers **ARP** terms.
Consult your parts and accessory jobber or
write Commercial Credit Corporation, Balti-
more, Md. for details and **FREE** display sign.

**TIME PAYMENTS FOR
CAR REPAIRS**
* TIRES AND OTHER ACCESSORIES

WE OFFER
**COMMERCIAL
CREDIT PLAN**
ASK FOR INFORMATION

COMMERCIAL CREDIT CORPORATION

Ring Film Produced

According to an announcement just made by Don H. Teetor, manager of replacement sales, The Perfect Circle Co. has just released a new educational film for dealers, service men and mechanics. Commenting on the new film, Teetor said, "Our new film, 'That High Power Top Inch,' was produced and made available to the industry because of the thousands of requests we have received from dealers and mechanics in the last year or two for more service and engineering information on piston rings. In 'That High Power Top Inch' we have told the

story of piston rings—what they are, how they work, and how to install them, in simple ABC language and with many pictures to make the story clear and interesting."

Another important part of the Perfect Circle educational program for dealers and mechanics is a new 60-page Service Manual which is a reproduction of the film in booklet form.

Heads Engineering Staff

M. K. McGrath, president of the Kellogg Switchboard and Supply Co., Chicago, announced that F. G. Gardner of the engineering staff has been

selected to fill the position of acting chief engineer. This appointment places a veteran of 40 years' experience in the electrical communications industry at the head of the engineering department and research laboratory of one of the oldest and largest independent telephone equipment manufacturers. George R. Eaton, vice-president in charge of engineering, is taking a leave of absence at the advice of his physician because of ill health.

Training Schools to Follow

Army Field Maneuvers

New itineraries for the Ford "mobile classrooms" used for training Army officers in mechanics at various camps across the nation have been revealed by the Ford Motor Co.

The big trucks, fully equipped as traveling mechanical schools and staffed by a driver and two Ford instructors, are scheduled to continue visiting army posts until late in November. At each base, the schools train officers who in turn become instructors in mechanics.

The "rolling classrooms" have been on the road since last April and already have covered more than 6000 miles and visited camps from Massachusetts to California.

Army maneuvers in the Southern States will keep the Ford service school trucks busy during the fall months. One unit will follow maneuvers in the field starting from Camp Joseph T. Robinson at Little Rock, Ark., in mid-August. Another truck will serve with two separate maneuvers at Camp Bauregard in Louisiana—one during August and another in late September.

Another truck unit will "cover" maneuvers during October at Fort Bragg, Fayetteville, N. C., and will move to Camp Jackson, Columbia, S. C., to join maneuvers at this post during November.

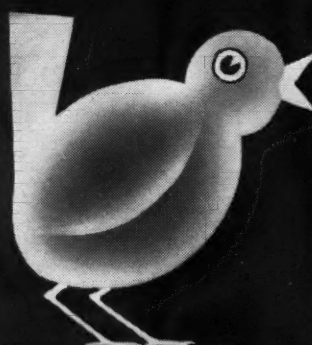
New Propeller Plant

Ready to Start Production

Housed in a new, modern plant of 193,000 square feet floor space, Aero-products Division of General Motors Corp., near Dayton, Ohio, is ready to start building a new-type hydraulic airplane propeller for the U. S. Army Air Corps., E. R. Breech, vice-president of General Motors, announced, recently.

Already, the plant is working on a three-shift, six-day-a-week basis, with five different models of propellers in the testing stage.

Before the end of the year the plant will employ about 1800 workers. More than 500 employees are engaged at the present time in trainee production, testing propellers and in completing the installation and setting up of tools and machinery. When operating at full capacity about 2600 employees will be needed, Breech said.




RUBBER CANARIES

... have no relationship to the yellow, musical variety but are just plain, ordinary squeaks.

To cure this service station "head-ache" that grew worse as more and more rubber parts were added to cars, we originated and patented a lube that protects and lubricates the rubber.

Ask your oil supplier about his colloidal graphited rubber lube -- most of them distribute it under their own brand names . . . but labeled to indicate that it contains "dag" colloidal graphite.

ACHESON COLLOIDS CORPORATION
PORT HURON, MICHIGAN



"dag" is a registered trade mark of the Acheson Colloids Corporation

- Shock Absorber Bushing
- Tie Rod and Drag Link End Bushing
- Steering Column Gear Shift Bearing
- Shock Link Bushing
- Pitman Arm Bushing
- Shock Absorber Rubber Bushing
- Stabilizer Bar Mounting
- Shock Absorber Link Rubber
- Steering Column Bushing
- Muffler Bracket Grommet
- Pitman Arm Bushing
- Throttle and Choke Rod Ball Joint Insulator

Important Notice

WEED TIRE CHAINS

National Defense work will make Weed Chains more important this winter than ever before, as millions who drive to work must get through safely regardless of snow or ice. There will be days when Weed Chains will do more than anything else to "Keep Cars Running." And people will look to you to supply them.

Weed American Chains Conserve Steel by Giving More Than Double Mileage

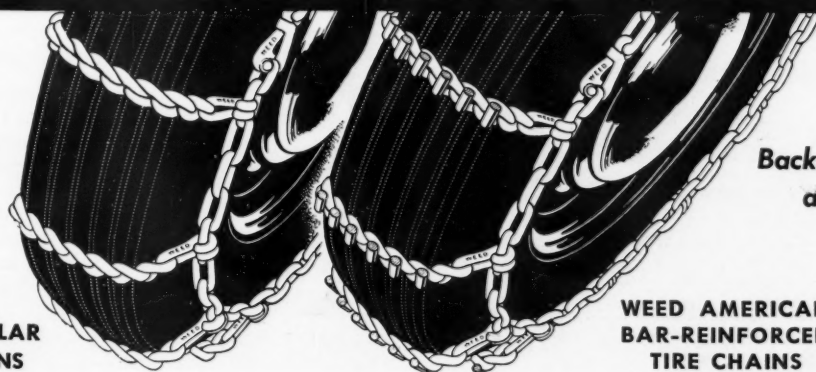
Supply your customers with the quality chain—Weed American. More than double mileage. Greater traction and greater safety. The best buy in tire chains—the chain they'll thank you for recommending. Four sterling features:

1. **Bar-Reinforcements** on links give double the service.
2. **Weedalloy**—a stronger, tougher metal.
3. **Patented Lever-Lock End Hooks**—easy to use and positive fastening.
4. **Side Chains** welded and hardened to resist wear on curbs and ruts.

Order your supply of Weed Regular and Weed American Bar-Reinforced Tire Chains now. Be prepared for your share of the sales that will keep traffic moving when snow comes.

Take advantage of fast selling assortments in the Weed Profit-Pak and the Weed Handi-Pak. Consult your Weed Chain jobber.

American Chain & Cable Company, Inc. • York, Pa.



**WEED REGULAR
TIRE CHAINS**

**WEED AMERICAN
BAR-REINFORCED
TIRE CHAINS**

**Backed by 40 years of research
and national advertising**

Lempco Products to Import South American Tools

Machine tools made in South America will soon be sold to American defense industries by Lempco Products, Inc., manufacturers of automotive shop equipment, it has been announced.

James F. Strnad, president of the company, said the concern's first carload shipment of imported machine tools arrived in New York July 21 from Argentina. He disclosed that his company, which has its plant on Dunham Road, Maple Heights, Ohio, has made arrangements to serve as ex-

clusive American and British distributors for five machine tool manufacturing companies in Argentina and Brazil.

Dodge Truck Names Miller

Appointment of Allison Miller as assistant sales manager, Truck Division, Dodge Brothers Corp., has been announced by L. D. Cosart, sales manager. Previous to his present appointment, Miller was Philadelphia regional manager for Dodge. A graduate of the U. S. Military Academy at West Point, Miller joined Dodge Brothers Corp. originally in 1925 as district manager in the Dallas region.



"If you could only cook!"

Packard Gets Contract for U. S. Marine Engines

President M. M. Gilman of the Packard Motor Car Co. announced consummation of a new \$19,000,000 defense award calling for immediate production of an additional 900 aviation type marine engines to power U. S. and British surface torpedo boats.

The new award has been in negotiation since enactment of the Lend Lease Act. The increase is designed to fill additional needs of the U. S. Navy together with British requirements under terms of the Lend Lease Act.

One of the first automotive manufacturers to receive defense assignments, Packard began production of its 1350-hp. marine engine more than a year ago. The new award brings the program to a grand total of 1620 engines. Current production is at the rate of three a day.

The new, increased award will necessitate stepping up production to five engines a day. Simultaneously production of spare parts will raise production to approximately seven engines.

B. Marco Hecht Promoted

Marco Hecht, President of the Guaranteed Parts Co., Inc., of Seneca Falls, N. Y., has announced the appointment of B. Marco Hecht as general field supervisor. B. Marco Hecht has for many years been district manager for the Guaranteed Parts Co., Inc., in the New York area and brings with him to his new appointment a thorough knowledge of the after-market industry and a successful selling career.

HYPRESSURE JENNY

STEAM CLEANER

Makes you money three ways!

The *extra* income you want can come only through better profits on present business, or from brand new cash sources. Here are 3 ways to ring up added dollars with HYPRESSURE JENNY:

1. Sell motor and chassis cleaning jobs with washes and lubes. A "like new" engine cleaning brings \$1.50 to \$3.00—takes only 10 to 15 minutes. Owners buy readily—they know their cars may have to last a long time, now!
2. Get \$15 to \$50 more for used cars (an established fact!) by spic-and-span JENNY cleaning before showing. Moves 'em faster, too!
3. Earn up to 40¢ more out of each repair dollar! JENNY cleaning before repairs saves 15 to 25 minutes of mechanic's time usually lost fighting dirt and grease. Statistics prove it!

Investigate! Fill in the coupon for a *fact* survey now.

HOMESTEAD VALVE MFG. CO.
P. O. BOX 95 CORAOPOLIS, PA.

O. K.—Send that Survey.

We recondition, repaint, repair.....cars or trucks monthly.

We employ.....mechanics on dirty, greasy repair work.

NAME.....

ADDRESS.....

SEND FOR THIS
FREE SURVEY
TODAY!

SURVEY

**KNOW HOW TO
PUT YOUR FINGER
ON THE SALE?**



Gould Guide helps you find the battery buyer!

Figures indicate that half of your customers will buy replacement batteries this year. If you have 200 customers, that means 100 profitable sales you ought to make—and a nice sum to add to the gross.

But how can you pick the ones who'll buy? How can you cultivate them? How can you prevent their doing business with the shop down the street?

The GOULD GUIDE answers these questions in a way that spells new profits to the Gould dealer. Sales records show that dealers who have followed the Gould plan have averaged a 22% sales increase—all in the bigger, better types of batteries with their longer profits and minimum of service expense. The Gould plan is a tested, proven way

to find the battery buyer and to sell him. The GOULD GUIDE TO GREATER PROFITS explains all. Send for it today. Gould Storage Battery Corp. Factories at St. Paul, Depew, N. Y., North Bergen, N. J., Leavenworth, Kans., Atlanta, Chicago, Dallas, Los Angeles.

GET THIS FREE BOOK

Gould Storage Battery Corp., F45, St. Paul, Minn.
Send at once free booklet GOULD GUIDE TO GREATER PROFITS.

Name.....

Address.....

City..... State.....



GOULD
THE BATTERY PICKED BY ENGINEERS



ADVERTISED TO
YOUR CUSTOMERS
IN THE
**SATURDAY
EVENING POST**

2 New Directors Added by Sealed Power Corp.

At the annual meeting of the stockholders of the Sealed Power Corp., Muskegon, Mich., the by-laws were amended to provide for two additional directors. A. W. Lines, president of Accuralite Co., a division of Sealed Power Corp., was elected as one of the new directors along with Lester Matthews, who is now credit manager and assistant treasurer of Sealed Power. These two men will serve for the ensuing year with the following who were re-elected:

Charles E. Johnson, Paul R. Beardsley, Paul C. Johnson, Raymond R. Beardsley, Neil A. Moore, and Carl P. Damm.

New District on Coast Created by Goodrich

Several changes in the western organization are announced by W. S. Richardson, general sales manager of the mechanical goods division of The B. F. Goodrich Co.

A new California district is created, with headquarters at Los Angeles and a branch office in San Francisco, to

include the present Los Angeles district territory and revised San Francisco district territory. L. L. Horchitz, who has been manager of the Los Angeles district since 1929, is named manager of the new district, with H. A. Schultz branch manager at San Francisco.

C. M. Christensen has been named manager of the Denver district, succeeding Max Schmidt, who remains on the district staff in an advisory capacity.

Willys-Overland Sales Up 60 Per Cent Over 1940

Consolidated net income of \$111,442 was earned by Willys-Overland Motors, Inc., after all charges and provision for Federal income taxes at existing rates, in the three months ended June 30, 1941, Joseph W. Frazer, president, reports. These earnings compare with a net loss of \$182,047 in the comparable period last year.

Consolidated net sales for the quarter amounted to \$5,853,960, highest for the June quarter since 1937, and an increase of 60 per cent over sales of \$3,658,767 in the comparable three months of 1940.

More Allison Ordered

Receipt from the War Department of an additional contract for Allison liquid-cooled airplane engines, involving approximately \$50,000,000, has been announced by F. C. Kroege, vice-president of General Motors and general manager of the Allison Division. The contract brings the total orders for Allison engines since the beginning of the present emergency to approximately \$242,000,000.

Allison engines power the Bell Airacobra, the Curtiss P-40, the Lockheed Lightning (P-38) and the North American Apache, pursuit and interceptor planes of the U. S. Army. The engine also is used by the Royal Air Force.

Walter R. Bamford

Walter R. Bamford, service director of the Dodge Division of Chrysler Corp., died Aug. 2 from a heart attack at his summer cottage near Brighton, Mich. Bamford, who was born in Detroit 56 years ago, spent the greater part of his business life in the automobile industry, having been associated with Oldsmobile, Chalmers, Hupmobile, Maxwell and Fulton Truck. His connection with Dodge dated from 1925.

Alex L. Cohen

Alex L. Cohen, 53, vice-president of Jules Cohn, Inc., of Buffalo, automobile accessory firm, died June 30 at his home. He was one of the organizers of the Buffalo company and was a well known figure in the accessory trade.



Makes you a RADIATOR TESTING EXPERT!

Tests Over 100
ANTI-FREEZES

New



FREEZETESTER

with Instant Protecto-Gage



WHAT IT DOES

SHOWS you how to test the over 100 brands and types of anti-freeze now in common use.

ENABLES you to show a motorist instantly the additional protection given by each added quart of anti-freeze.

SHOWS how many additional quarts of anti-freeze are needed to protect a radiator down to any given temperature.

GIVES the answers for all the most popular makes and models of cars.

In short—MAKES you a radiator testing EXPERT!

NOTE THESE ADVANTAGES

HAS NEW SEALED-IN-GLASS THERMOMETER. Murky, rusty radiator solutions can't possibly cloud readings.

HAS NEW REVOLV-A-CHART which rotates on barrel and gives perfect eye alignment of float, thermometer and freezing points.

EXCLUSIVE SYSTEM OF COLOR BANDS (plus figures) makes possible faster readings—eliminates errors.

POLARIZED GLASS JAR withstands sudden changes in temperature; is strain-free.

Metal GUIDE CHART—PROTECTO-GAGE—that you can hang right at the pump — included with tester.

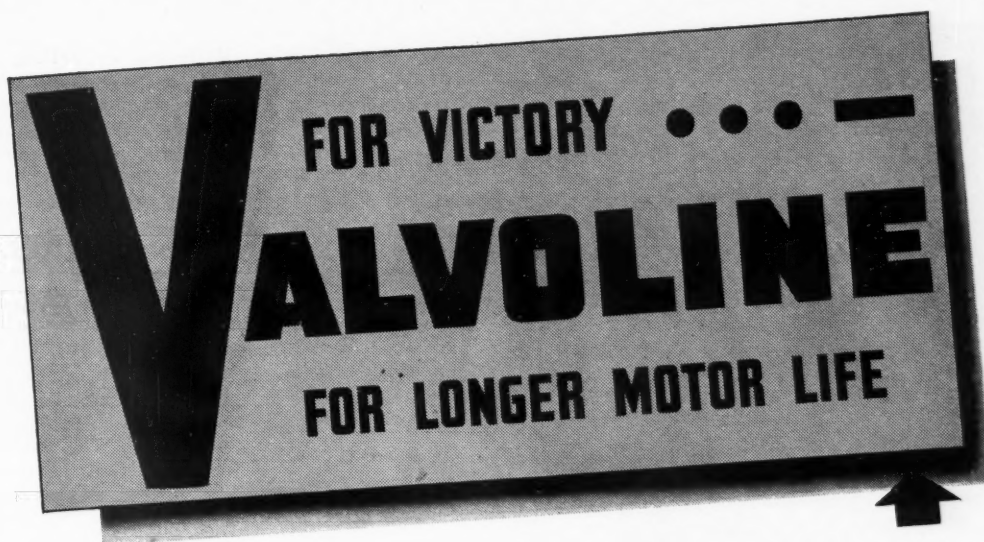
Order from your Jobber or write for Bulletin No. 324

THE IMPERIAL BRASS MFG. CO., 1217 W. Harrison, Chicago, Ill.

IMPERIAL Automotive Products

TUBE FITTINGS • FLEXIBLE TUBING • TUBING SERVICE TOOLS • BATTERY TESTERS • FREEZETESTERS • WELDING OUTFITS AND SUPPLIES

No. 546-T
FREEZETESTER
Only
\$3.45
Dealer's Cost



BUILD YOUR SERVICE SALES WITH SENSATIONAL NEW "V" CAMPAIGN:

V banners for your station—tied in with a complete personalized program for building service business.

Man, it's a *natural*.

You've been looking for a way to make car-owners see the vital need of taking better care of their motors. Something to drive home the tremendous importance of conserving their cars through quality lubrication and adequate service.

Here's your answer!

Everybody's talking now about "V for Victory!" Soon the entire automotive trade will be talking about the new Valvoline "V" Campaign!


Get all the facts *at once*. Put on a Valvoline "V" drive for Fall change-overs. Act quick, for quick results. Phone, wire or air mail your inquiry TODAY.

THESE "V" DEALERS ARE WINNING:

Stevens Buick Co., Mt. Vernon, N. Y., increased Valvoline Oil sales 60%, Valvoline Grease sales 150% over 1940.

Cadillac Service Co., Green Bay, Wis.—100% more Valvoline this year.

Results like these, Coast to Coast, show swing to Valvoline New "V" Campaign offers you even greater opportunities!



FOR VICTORY . . . —

VALVOLINE

OIL COMPANY

540 East Fifth St., Cincinnati, Ohio
New York • Chicago • Atlanta • Los Angeles

FIRST OF THE PENNSYLVANIA OILS



Recently completed addition to the plant of the Raybestos Division at Bridgeport, Conn. The new brick-and-steel building provides 20,000 square feet of floor space. It will make friction materials for both the automotive and airplane industries.

SMALL PAYMENTS BOOST BUSINESS

"CREDIT business is the most profitable class of trade a service man can have if he goes after it on a volume basis and develops specialized facilities for handling it." So says Domingo Vallerga, owner of the Melrose Auto Service, Oakland, Cal., one of that city's largest and most successful independent garages.

Vallerga started his present estab-

lishment nine years ago. All during the period, when most garagemen were switching to a straight cash operation, he went out and sold the credit idea. His losses have never exceeded 2 per cent. He never knew there was a depression. Today an estimated 75 per cent of his business is done on credit.

The answer lies in specialization.

Vallerga, by selling the credit idea, developed a large enough volume to justify a highly efficient credit department. Every customer is carefully checked up before he is given credit. And, even though he takes only a month to pay, his work is put on a contract.

Very little advertising has been required to put over the credit idea. Because of its scarcity in the independent garage field, customers talk about it. One credit job nearly always brings several others.

The shop caters primarily to working men whose incomes are small but steady and who are 100 per cent reliable. If they need a major job and can't raise the money at once, they are put on a budget contract. The maximum payment period is six months.

Every person requesting credit is required to fill out an application blank of the type used by large department stores. It gives name and address, length of residence at the current address, employment information including a record of past jobs, monthly income data, status of car—if clear or mortgaged and so on. The application is checked up in every respect and the decision made accordingly. Misrepresentation immediately

(Continued on page 108)

LONGER LIFE



MODERN EQUIPMENT CORP.
DEFIANCE, OHIO, U.S.A.

Every well equipped automotive shop has a number of air operated tools . . . and these put a heavy responsibility on the compressor. If you want long life and trouble-free performance, buy PAR, the compressor that pumps faster . . . runs cooler, quieter, without vibration!

By Comparison — You'll Buy

PAR

"HOW TO BUY AN AIR COMPRESSOR" . . . a fact-filled catalog and check list — is yours for the asking. Write for your copy today!

WE'LL TELL YOU WHY YOU'RE GOING TO SELL MORE G-E MAZDA AUTO LAMPS THIS FALL THAN EVER BEFORE!



NIGHTS ARE LONGER!

**CAR REGISTRATIONS
ARE AT A PEAK!**



**MORE CARS ARE BEING
DRIVEN AT NIGHT!**

**MORE OLD CARS NEED
HEADLIGHT SERVICE!**

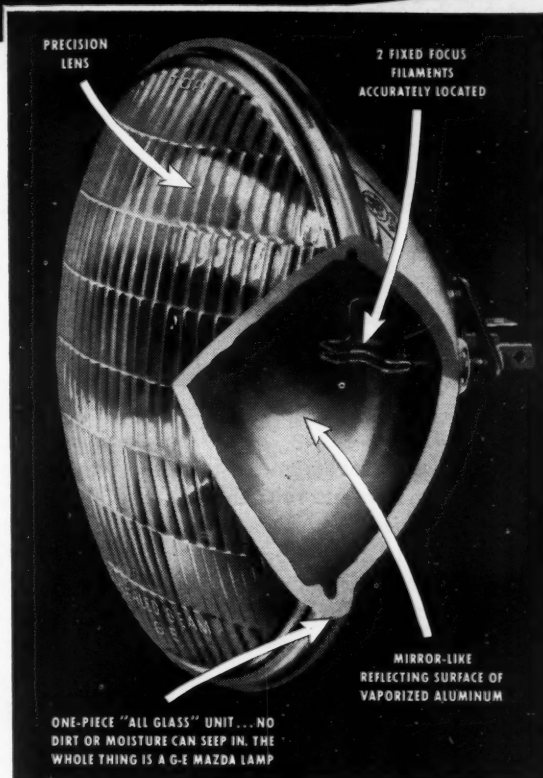


**MOTORISTS HAVE MORE
MONEY TO SPEND!**

**NIGHT TRUCKING
IS BOOMING!**



**THERE'LL BE MORE
SEALED BEAM RENEWALS!**



The line of "All-Glass" G-E MAZDA lamps includes three types, each with the same basic construction as shown in the photo above of the Sealed Beam lamp which fits the headlights of 1940, '41, and '42 cars. Other types are: The "All-Glass" G-E MAZDA Fog lamp, and the "All-Glass" G-E MAZDA Driving and Passing lamps (the Glaseal System) for pre-1940 cars.

If it's an "All-Glass" lamp THE WHOLE THING IS A BULB!

Every "All-Glass" G-E MAZDA Auto lamp is a complete one-piece G-E MAZDA lamp . . . with fixed focus filaments, hermetically sealed inside a glass reflector, fused to a glass lens.

The "All-Glass" G-E MAZDA lamp is a heavy duty product of rugged, sturdy construction throughout. It gives controlled light because the light goes directly from the filament to the reflector.

"Blackening" loss, too, is practically eliminated. In fact, it is less than 1/6 of that in pre-1940 headlamps. G.E. makes only the lamps, not the housings.

Order an ample stock of all three types of "All-Glass" G-E MAZDA lamps today from your G-E MAZDA lamp distributor's salesman!

G-E MAZDA LAMPS
GENERAL ELECTRIC

*Made to stay
brighter longer*

SMALL PAYMENTS

(Continued from page 106)

disqualifies the applicant. The customer must always have sufficient equity in the car to protect the company's contract.

If a man is reliable, the terms are made to fit his convenience. In the case of a \$15 job, the payments would be \$2.50 a week over a six-week period. There is no interest or carrying charge. By carrying practically all his own paper, Vallerga is able to pocket the 10 per cent he would other-

wise pay a finance company to discount the paper. Thus he comes out in good shape without charging interest.

While the credit office proper is upstairs, the company has placed a budget department on the main floor for the convenience of customers. Applications can be made out here and the credit manager is called downstairs for his discussions with customers. The size of the average budget account has been greatly increased through a display of sideline items—bicycles, auto and home radios, dual air-electric horns and so on—on the

service floor right beside the budget office. An estimated 25 per cent of the company's budget contracts carry additional items.

The customer's signature on the contract certifies that the job was satisfactory. Thus, the company protects itself against any assertions that the bill was not paid because the job wasn't satisfactory.

However, the number of disputes and slow collections is very small. About 85 per cent of the payments due either come in on time or are delayed with company permission. When the job is sold, the customer is always told that, in case of illness, a layoff or other legitimate reason for delay, he will be given every consideration, providing he gives proper notification.

The company's liberality in this respect has actually speeded up collections, and at the same time has held collection costs to a minimum. If a customer can't meet a payment, he usually calls and explains the situation, thus saving the collector a call. The patron is asked to set a date when he can pay and, if anything prevents his keeping that promise, to call in again. As a result of this policy, the Melrose shop usually gets the preference over other creditors when the customer does get some money.

Where a payment isn't met within five days after due date and the company isn't notified, the credit manager personally contacts the customer by telephone and tries to get a definite promise. On the promised date, he makes a trip to the patron's home to get the money. If the money isn't forthcoming then, a second appointment is made. As long as honesty is indicated, the firm "plays ball" with the customer. Otherwise, the follow-up is turned into legal channels.

The telephone and personal follow-up has almost replaced collection letters in recent years. Experience proved to this firm that while more costly in point of time than letters, the actual contacts are well justified by their added effectiveness.

Buys Horn Division

Knight-Morley Corp. has announced the purchase of the Automotive Horn Division of the Schwarze Electric Co. Products of the corporation now include mirrors, venetian blinds (for car windows), ornaments, glare shields, locking gas caps, deck lights, coat hangers, and automotive horns.

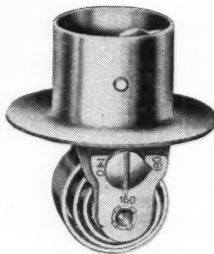
Moves Western Office

Petroleum Solvents Corp., manufacturers of Siloo products, announces the removal of its western office and San Francisco warehouse to 516 Townsend Street, San Francisco, Cal. The location formerly was at 524 Van Ness Avenue in that city. Irving Tick is western division manager.

76 of the Next Hundred Cars You Service NEED THIS REPLACEMENT

● This profit opportunity exists on most cars you'll service this season. You can promise a positive saving on the next six months' driving—better gas mileage, less oil dilution, less sludge and less wear and tear on the motor if you replace the old thermostat with a new Dole Motor Block Thermostat. Modern cars need thermostatic control to effect these savings and—

**SAVINGS ARE VITAL THIS
YEAR—CASH IN**



Dole Adjustable Thermostat—included in low cost assortment covering most cars.

DOLE

Replacement
THERMOSTATS

Also: Dole Poppet Type Thermostats recommended to step up hot water heaters.

THE DOLE VALVE COMPANY

1901-41 Carroll Ave., Chicago, Ill.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

IMPORTANT

to all "Prestone" anti-freeze dealers

A message entitled:

"National Defense and the 'Prestone' Anti-Freeze Shortage"

will appear soon in leading national magazines. It explains that the demands of national defense on the raw materials used in making "Prestone" anti-freeze . . . as well as great demands on the finished product . . . have resulted in a shortage. It emphasizes that those who every year rely on "Prestone" anti-freeze should see *their dealers early*.

This advertisement will appear in *The Saturday Evening Post*, *Collier's*, *Life*, *Liberty*, *Time*, *Fortune*, *The American Magazine* and 27 other magazines. It will be read in millions of the nation's homes. It will be followed by other advertisements developing the same theme. These advertisements will explain—for you—the reasons behind the "Prestone" anti-freeze shortage.

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation



The word "Prestone" is a registered trade-mark of National Carbon Company, Inc.



ALL America is united in support of the defense program.

To help out, car owners will buy fewer new cars . . . keep old cars in service for another year.

That means millions of cars to be serviced. It means a repair and accessories market of hundreds of millions more than the normal.

You can get the lion's share of this extra volume if you give your customers terms that make it easy to pay for a thorough, quality job.

It means extra profits in your pocket if you sell labor, parts and accessories on the Automobile Reconditioning Plan.

Ask your jobber, or write us direct, for full details, and the FREE sign that brings in the business.

Do you need new equipment? Buy now and pay for it out of your profits. Ask your equipment jobber about A. E. P. . . . the purchase plan endorsed by the Automotive Equipment industry.

AEP

**COMMERCIAL CREDIT
CORPORATION**

TEACH HER TO CARE — for Her Car

By ROSE LU GOLDMAN

"HOW should I drive my car to insure me the greatest service with a minimum amount of wear and tear?"

"What can be done to preserve the appearance of my car?"

"In view of the possible shortage of gasoline on the Eastern seaboard, what adjustments can be made to my car and how should I drive to receive maximum mileage per gallon?"

These are just a few of the questions asked the automotive editor of one of the national magazines by today's women drivers. These women have been told that new car production—already reduced to make room for the production of war materials—faces even greater curtailment, and they must, therefore, take care of the "old bus" if they want a car at all.

On all sides, they see evidences of the rise in prices, especially in gasoline, oil, and mechanical parts, and they've decided that careless and wasteful driving is not only selfish and unwise, but unsound for a family trying to get along on a budget.

They have learned that the government is to curtail on installment buying, and to many families tighter credit terms would mean a long wait between purchases . . . so take care!

And, of course, shortages have been brought home clearly to the women of America, what with the collections of aluminum pots and pans, the disappearance of tin foils from foods, and the virtual stoppage of silk hose production. Today care and conservation of one's possessions is not only a patriotic service, but a wise investment in one's own future comfort.

And so, women today are anxious to learn about proper car care. They make inquiries at service stations, write letters such as we mentioned above, and they even attend whole-hearted classes in automobile repairing given as defense training.

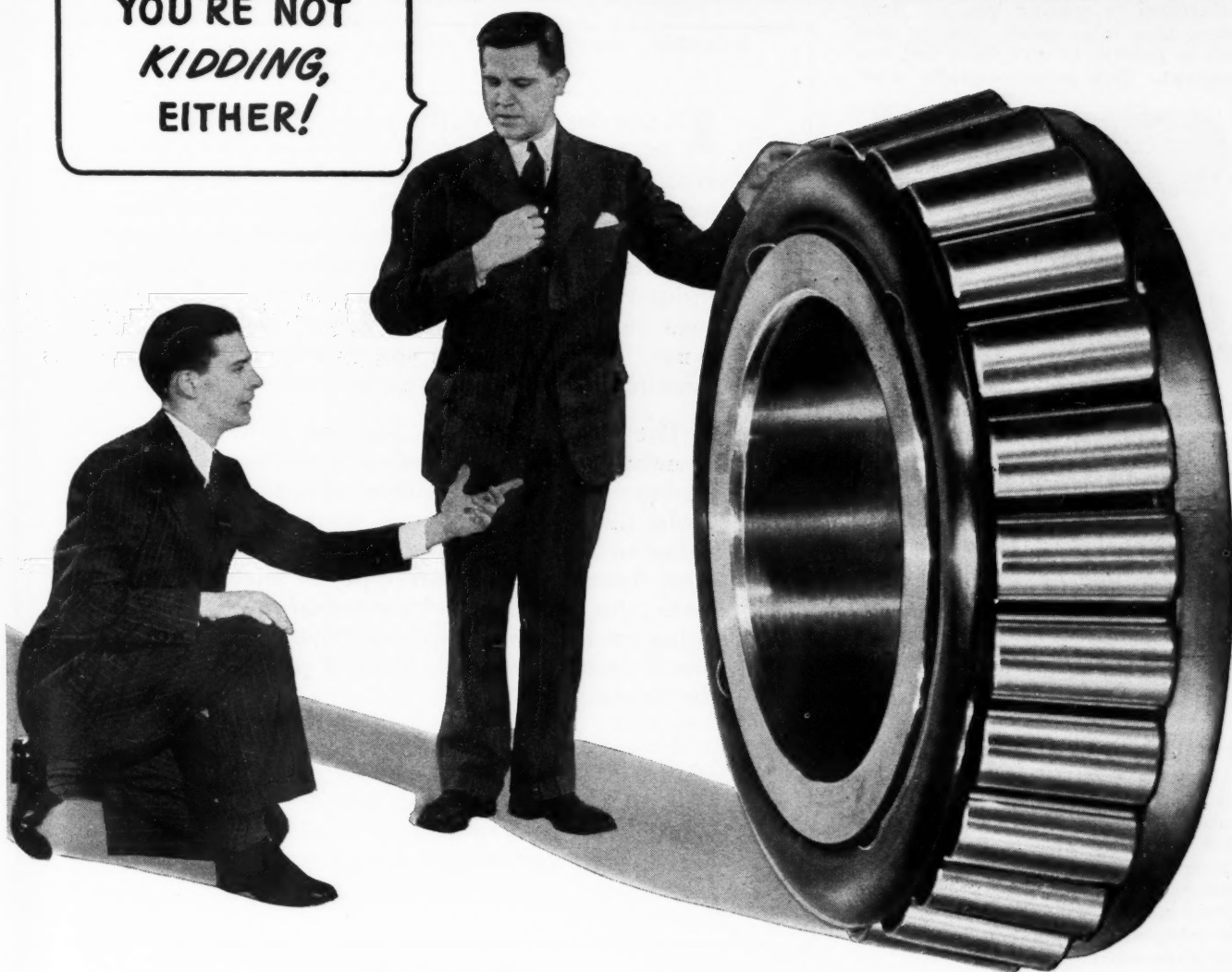
All this interest has a definite cash value for the service man. Let the rest of the automobile industry sing the blues during this "emergency" if it wishes, but the service stations will prosper, for never before have drivers (and least of all, women) been so anxious to give them business and do as they are advised. The rôle of the service manager is rapidly changing from that of service salesman to adviser and teacher. Drivers are already "sold" on doing something; the question they ask is "what?"

They should be told the value of lubrication, and then reminded of it when their car is due for lubrication. The importance of keeping the exterior clean and waxed should be carefully explained to customers who take pride in appearances. They should be shown just how important proper wheel alignment is to tire wear; and made aware of the savings in gasoline, brake linings, tires and general engine wear that are possible by gradual starting and stopping.

Today's secret of success lies in the one short sentence: Teach Her To Care!

"A Better Bearing for Bigger Jobs!"

YOU'RE NOT
KIDDING,
EITHER!



● "No job too tough for Tyson Cageless" is no mere slogan. Whether called upon to serve in power shovels, oil field equipment, Army and Navy guns—or to move heavy trucks, buses and tractors—Tyson Cageless can take a lot of

punishment and come up smiling... Usually outlasts conventional cage-type bearings two to one, in interchangeable sizes and under the same operating conditions.

... Tie up with Tyson now!

Cageless FOR HARD SERVICE

Cage-type FOR REGULAR SERVICE

Tyson

TYSON ROLLER BEARING CORPORATION, MASSILLON, OHIO

FOLLOWING is a brief digest of important articles appearing in this issue of **MOTOR AGE**. Read the digest and discuss the service procedure with your customers.

HELP YOUR CUSTOMERS SAVE GAS

Never before have owners been so interested in making less gas drive their cars more miles. Service men are in position to turn their desire to account. This article explains what



can be done to tune up engines for greater fuel economy and how to do it. It is not only a service that owners value but an opportunity for the service man to help ease the problems of gasoline shortage.

BIG BATTERY BUSINESS IN SMALL SHOP

If any further proof were needed to convince service men that selling new batteries is not the exclusive privilege of electrical shops, this yarn about a country repair shop in Pennsylvania ought to clinch the argument. It proves that any shop with the determination and the equipment can get into the battery business in a big way.

LIGHT OIL OR HEAVY?

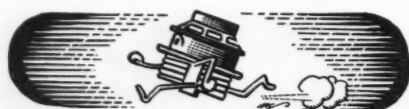
Because light oils have proved so satisfactory for certain engine lubrication requirements, many users, says the authority who contributes this thought-provoking article, have been using it for purposes for which it was never intended. He shows the dangers of using oil of improper viscosity at certain seasons.

RECONDITIONING BRAKE DRUMS

Because material shortages are imminent, wise service men are turning their attention to reconditioning drums rather than depending on a continued supply of replacement drums. Here, in a clear but brief article, is contained all the dope they need to correct scored, out-of-round, and bell-mouthed drums.

TEST THE THERMOSTAT

With cold weather coming on in most sections of the country, the cool-



JOBBER'S OF THE AUGUST

IN the days ahead, the jobber and the serviceman will be obliged to work in closer cooperation than ever before in the history of the automobile industry. The reason is simple. The country has never before found itself faced with the possibility of a motorized war, and the industry has not before been required to devote so much of its productive ability to defense. Everyone concerned with automobiles must learn to get along on less of everything.

The situation calls for the fullest understanding of the other fellow's problems. When jobbers find it impossible to deliver parts or tools, the serviceman who knows the reason is going to take it in good spirit. When servicemen demand a certain type of machine-shop work, the jobber who knows that the demand is being created by conditions beyond the serviceman's control will take steps if possible to meet the demand.

This digest of articles appearing in this issue of **MOTOR AGE** has been prepared by the editors to help the jobber get the serviceman's slant. It will pay you to read the digest or, better still, the articles themselves.

ing system must be put in first-class shape. The heart of the system on modern cars is the thermostat. This article shows how these units can be tested, why they fail, and why they must be replaced if not operating properly.

PROVING GROUND FOR BEARINGS

Drivers, roaring over its 160 miles of concrete, uninterrupted by cross roads or real grades, call the Pennsylvania Turnpike the dream highway, but for the engines of their cars it is something else. Bill Toboldt toured the Turnpike to learn why so many bearings were being replaced and so many crankshafts reground. He reports his discoveries in an article that

makes "must" reading for service men, engineers, and jobbers.

TRANSMISSION OVERHAUL

One of those articles that service men like to keep within arm's reach so they can be referred to instantly when a particular job rolls into the



shop. This article explains in instructive pictures and captions how time and trouble can be saved in disassembling the conventional transmission used in the 1941 Studebaker Champion.

DIGEST MOTOR AGE

HOW'S BUSINESS

A MONTHLY REPORT ON MAJOR ITEMS BY 500 JOBBERS

AUGUST, 1941

NATIONAL TOTAL	Good	Fair	Poor	NATIONAL TOTAL	Good	Fair	Poor
ACCESSORIES	Fair			SHOP EQUIPMENT	Fair		
Abrasives	75	95	11	Battery Charging Equipment	49	83	41
Anti-Freeze	61	51	43	Car Lifts	18	64	74
Car Radio Sets	12	38	55	Car Washers	10	34	102
Car Radio Accessories	10	37	60	Compressors	43	84	36
Chains	14	37	100	Drills (Electric)	59	80	37
Heaters	25	47	87	Electric Testing Equipment	34	70	62
Horns	6	53	86	Jacks (Garage)	79	90	20
Lacquers	111	60	15	Lubricating Equipment	53	101	25
Oil Filters	35	70	5	Paint Spray Equipment	35	99	41
Oils and Greases	42	65	33	Tire Service Equipment	9	51	91
Polish	69	115	14	Tool Kits and Sets	62	65	43
Seat Covers	97	67	15	Valve Refacers	23	90	66
Thermostats	8	62	100	Wheel Aligners	13	61	84
REPLACEMENT PARTS	Good			Wheel Balancers	22	62	76
Axle Shafts	38	97	62	Frame Straighteners	10	32	101
Ball and Roller Bearings	116	81	8	Head Light Testers	9	37	102
Brake Lining	126	80	10	Welding Equipment	44	88	38
Bushings	67	93	29	TIRES	Good		
Chains (Timing)	23	99	68	Casings	27	26	10
Clutch Plates and Parts	121	64	14	Tubes	33	31	9
Fan Belts	164	49	9	ELECTRICAL UNITS	Fair		
Gaskets	172	30	7	Armatures	62	115	19
Gears (Rear Axle)	39	94	60	Batteries	99	95	15
Gears (Transmission)	56	99	40	Cable (Battery)	97	108	11
Mufflers	176	31	6	Coils	88	112	18
Pistons	59	115	29	Other Ignition Parts	110	97	11
Pins	83	105	13	Fuses	74	118	26
Rings	150	49	9	Ignition Wire and Cables	99	109	16
Radiators and Cores	23	51	78	Lamps	98	106	15
Spark Plugs	174	44	5				
Springs (Chassis)	38	85	47				
Valves	99	90	14				
Water Pump Parts	109	88	14				
Engine Bearings	158	45	5				

MOST ACTIVE LINES

Positions of Leaders	July 1941	July 1940	Aug. 1940	Positions of Leaders	July 1941	July 1940	Aug. 1940
Mufflers	1	1	1	Other Ignition Parts	11	14	12
Spark Plugs	2	7	5	Water Pump Parts	12	12	16
Gaskets	3	3	2	Batteries	13		15
Fan Belts	4	5	3	Ignition wire & cables	14		17
Engine Bearings	5	2	4	Valves	15	15	18
Rings	6	6	6	Lamps	16	13	14
Brake Lining	7	9	9	Cable (Battery)	17		13
Clutch plates & parts	8	10	11	Seat Covers	18	17	19
Ball & roller bearings	9	11	10	Coils	19	20	
Lacquers	10	8	8	Pins	20	16	20

HOW ITEMS ARE RATED

"Most Active Lines" are chosen on the basis of the highest number of jobber reports indicating "Good" for the items selected among the twenty most active lines. "Activity" as used here has no bearing on volume, so the lists should not be interpreted as meaning the lines on which jobbers are enjoying the greatest volume. Most active lines are those which the greatest number of reporting wholesalers indicate are selling "considerably above normal" in their particular markets.

HOW TO READ THIS CHART

Information from which this chart is compiled is obtained monthly from a selected list of 500 wholesalers. Figures show the number of wholesalers reporting. Normal is taken as average sales for this month during the past few years.

Good—Sales considerably above normal.
Fair—Sales slightly above or below normal.
Poor—Sales noticeably below normal.

FRONT END SERVICE

Time is important when it comes to working on front-end suspension units. These photographs give the ser-



vice man some valuable help on replacing springs and pivot pins in the suspension unit of the 1941 Chevrolet.

OVERHAULING THE 1941 PLYMOUTH DIFFERENTIAL

These photographs of each successive step in disassembling this unit and the brief explanatory captions give the service man all the information he needs to do a rapid yet correct job of overhauling. Along with other articles of the same nature, it goes toward making a veritable service handbook for the busy shop.

ALINING HINTS ON BODY SERVICE

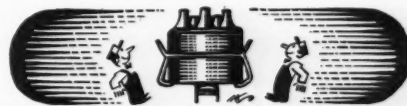
One of the really tough assignments for the average shop is to get a body back into line after it has been pushed around in an accident. This article gives a few rules for simple measurements that will make the task a great deal easier and will assure the service man that, when the job has been done, the body will be exactly as it should be.

READY FOR THE SERVICE BOOM

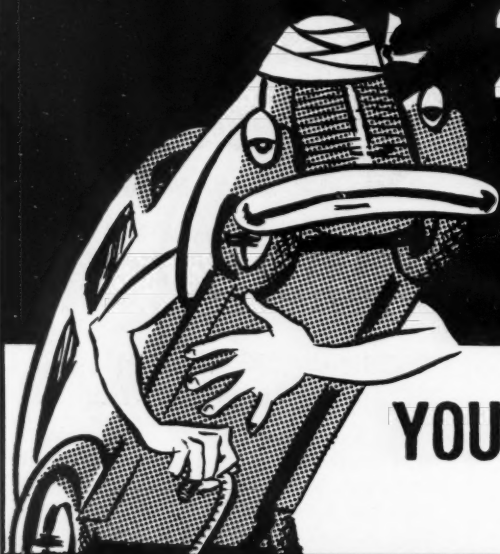
Here is one of the most significant articles on current service problems to appear in many months. A new-car dealer, watching the trend toward service, has built his new set-up around the shop. The sale of new cars, in which he has had a quarter century of experience, is to be distinctly a sideline. The article tells how the change affects his business, and his prospects for the immediate future.

SERVICING FORD SIX DISTRIBUTOR

Complete instructions in timely photographs and captions on overhauling the distributor of the new



Ford six-cylinder passenger car and truck engine. These data are likely to become increasingly valuable in the future.



27 MILLION CARS ARE BOUND TO GO WRONG

(Sooner or Later)

YOU CAN FIX 'EM QUICKER..BETTER

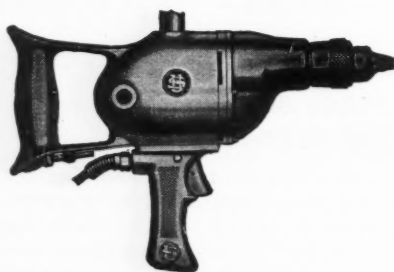
With

UNITED STATES ELECTRICAL TOOLS



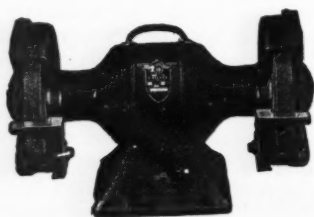
1/4" AUTOMATIC DRILLS

For maintenance or light production. Ball bearing. Permanently lubricated. Light but powerful.



1/2" COMMANDER DRILLS

Powerful general purpose drills. Ball bearing. Permanently lubricated.



"UTILITY" BENCH GRINDERS

6" to 10" sizes. For tool edging or general purpose grinding. Motors cannot burn out.

WRITE FOR CATALOG . . . SEE THE PICTURES . . .
READ THE STORIES OF THESE FINE TOOLS.

HASTE AND WASTE won't do at all in the automotive industry. But you can get better results in shorter time with good tools . . . and that means UNITED STATES ELECTRICAL TOOLS for innumerable uses.



THE UNITED STATES

CINCINNATI,



ELECTRICAL TOOL CO.

OHIO, U.S.A.



A BOSS with a THIN POCKETBOOK

• Operators of small locations really appreciate both the low price and operating efficiency of this Champion SE-26-60 compressor! Designed for locations requiring not more than 150 pounds unit pressure, this single-stage unit displaces 7 cubic feet of air per minute . . . ample for peak requirements of a car lift, two

tire lines, spring oiler, grease gun and intermittently used spray painting gun. Latest 1941 features include: sealed crankcase, ball bearing compressor, 1½ H.P. motor, air filter and muffler, etc.—yet it costs ONLY \$190. Write Now for Free Champion Compressor Catalog!

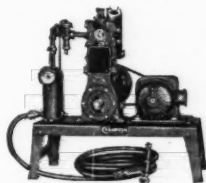
CHAMPION PNEUMATIC MACHINERY CO.

8192 South Chicago Ave.

Chicago, Ill.

Get Top Prices For Your Car Washing With This H-1!

This H-1 does faster, better jobs in less time at lower costs. Better jobs mean bigger profits! Delivers 5 gallons of water per minute at 300 pounds pressure.



H-1 Car Washer

CHAMPION

COMPRESSORS & CAR WASHERS



WITH
Quality
ELECTRICAL
AUTOMOTIVE
EQUIPMENT

also

USED BY LEADING
CAR, TRUCK AND
TRAILER MANUFACTURERS
AS ORIGINAL
EQUIPMENT.



Cole-Hersee Company

34 OLD COLONY AVENUE BOSTON, MASS.

SEND FOR
NEW 1941
SUPPLEMENT



Why look further? Put this NIEHOFF high quality line to work for you today. All parts come in handy kits and are precision fitted to simplify and speed up installation. Niehoff All-weather, non-evaporating Brake Fluid provides year 'round safe performance. Then the NIEHOFF Catalog gives you specifications and vital information on the installation of parts. Ask your Jobber's Salesman Today!

BRANCH: 1342 S. Flower St., Los Angeles, Cal.

C. E. NIEHOFF & CO.
4919 Lawrence Ave. Chicago, Ill.

GUNK USED CARS FOR QUICK RE-SALE

Cleaning Speed Triples on Warm Engines...
Faster than Steam Cleaning
... Much Lower Cost



GUNK P-96

General purpose garage and chassis degreaser. Dilute 9 parts low-cost kerosene . . . brush or spray on parts to be cleaned.

CURRAN CORP.
MFG. CHEMISTS, Malden, Mass.

Not in stock at my jobber . . . attached to my Business letterhead is my check, or M.O. on the condition that you ship me a 40 lb. 5-gallon size, GUNK at dealer's net cost of \$7.20—(\$8.00 west of the Mississippi) by FAST PREPAID AMERICAN EXPRESS . . . free of charge.

NAME
ADDRESS
CITY
STATE

List Price \$12.00
40 Lb., 5 Gal. Size
FOR DEALER NET
COST—SEE COUPON →

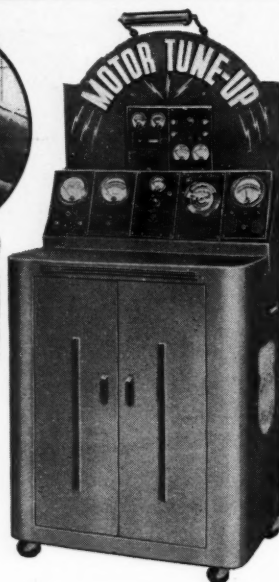
Go After Tune-up RIGHT!

With

ELECTRO
TESTING
INSTRUMENTS



DELUXE TEST STAND
AND BENCH
Suggests Tune-up to your
customers. Seven Electro
instruments; All steel;
artistic gray finish.



YOUR profits from Tune-up depend on the *importance* you give it. Go after it the **RIGHT WAY**—the **ELECTRO WAY**—and it will quickly become a big and thriving branch of your business. These fine instruments are easy to use—accurate—moderately priced—and unbeatable for value! Get action—Today—and go after Tune-up **RIGHT!**

CHECK ALL ELECTRICAL PARTS in 15 min. with Electro "Trouble Shooter." **FOR TUNE-UP WORK**, setting governors, etc. use Electro "Tachometer," R.P.M. Indicator. **BREAKER POINT "DWELL"** or Contact angle instantly shown by Electro "Cam Angle Indicator." **TUNE MOTORS TO PEAK PERFORMANCE** with Electro "Motor Peak-er." Many uses. **MIXTURE CHECK**—only 3 minutes with Electro "Mixture Master." **VOLTMETER—AMMETER & RESISTANCE** are combined in Electro "Acroset." **SPARK COIL CHECK** at all speeds in 2 minutes with Electro "Coilmaster."

CONVENIENT TERMS THROUGH C.C.C.

From your Jobber. If he can't supply genuine "ELECTRO" products **USE THE COUPON.**

ELECTRO PRODUCTS CO.,
621 E. 216th St., New York.

Send complete descriptive literature
on Electro Testing Instruments.

NAME

ADDRESS

CITY & STATE

Brooks Named Assistant

To Studebaker Sales Chief

Announcement of the appointment of M. S. Brooks, a veteran of the organization, as assistant to K. B. Elliott, vice-president in charge of sales, has been made by the Studebaker Corp. The assignment, becoming effective immediately, establishes Brooks in the corporation's domestic

sales and merchandising executive staff that is headed by Elliott.

For 11 years prior to his first Studebaker job, "Mel" Brooks was an instructor in automobile service, a retail salesman, service traveler, and service manager, serving five years with the Ford Motor Co. of Canada. In 1926, Studebaker appointed him sales manager of the Studebaker Corp. of Australasia, Sydney, New South Wales. A short time later he was made managing director.

Returning to the United States in 1932, Brooks was appointed manager of retail branches and, in 1934, was transferred to the Studebaker Corp. of Canada, Ltd., as vice-president and general manager. Three years later he was elevated to the presidency of that subsidiary.

General Electric Orders

Establish New Record

Establishing a record for a six months' period, orders received by General Electric Co. during the first half of this year amounted to \$521,139,000 compared with \$212,653,000 for the same period last year, an increase of 145 per cent, President Charles E. Wilson has announced.

Orders received during the three months ended June 30 amounted to \$263,757,000, a record volume for a quarterly period, and were equivalent to an increase of 129 per cent over the \$115,163,000 of new business booked in the corresponding period a year ago.

The company's orders definitely known to cover equipment for national defense purposes amounted to approximately \$216,000,000 in the

first six months this year, including \$104,000,000 received in the three months ended June 30, thus making a total of about \$466,000,000 of such orders received since the defense program was instituted last year.

De Soto Starts Plant

To Build Anti-Plane Guns

A large program of plant expansion, which will enable the De Soto Division of Chrysler Corp. to make new, important contributions to the production of national defense materials, has been launched at the company's automobile factory in Detroit, it is announced by C. E. Bleicher, vice-president and general manager.

Ground has been broken and construction work is being speeded on a new building 63,000 sq. ft. in extent, in which will be manufactured parts for a 40-mm. rapid-firing anti-aircraft gun, one of the most effective mechanisms of its kind now in use. De Soto will also manufacture parts for bombing planes.

JIM ASBESTOS SAYS:

• Summer brings out "Sunday drivers." Help promote highway safety, build up customer good will with



The Lifeguard of the Nation's Highways
JOHNS-MANVILLE BRAKE LININGS

LINCOLN LUBRICATING EQUIPMENT

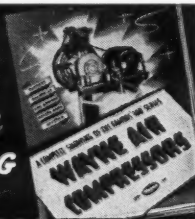
is the finest that money can buy
**COAST-TO-COAST
Sales and Service**

Ask nearest Lincoln jobber
or write us for details.

LINCOLN ENGINEERING COMPANY
General Offices, St. Louis, Mo.

A41-5

MAIL
COUPON
FOR Free
MONEY SAVING
CATALOG...



WAYNE AIR COMPRESSORS

NAME

ADDRESS

CITY..... STATE.....

The Wayne Pump Co., Ft. Wayne, Ind.

REPLACEMENTS?

You'll get them fast and sure by
RAILWAY EXPRESS. Also stock refills
and everything else required. Low
rates. High economy

—And—

For super-speed use **AIR EXPRESS**
3 miles a minute

RAILWAY EXPRESS
AGENCY INC.

NATION-WIDE RAIL-AIR SERVICE

THERE'S ONLY ONE



**BURN-OUT PROOF
DIRECTIONAL SIGNAL SWITCH**

In complete sets of Signal-Stats or as a
replacement switch—ASK YOUR JOBBER

SIGNAL-STAT CORPORATION

68 JAY STREET BROOKLYN, N. Y.



"What if the big dope is being called to the army next month? That ain't any reason for us goin' through this every morning!"

Pittsburgh Plate Glass

Business Sets Record

The volume of business enjoyed by the Pittsburgh Plate Glass Co. during the first six months of 1941 was larger than in any similar period in the company's history, R. L. Clause, president, reported in his quarterly message to stockholders.

Although net earnings were somewhat in excess of those of the corresponding period of last year, they did not show a proportionate increase with sales because of rising wage and material costs and the necessity of setting aside large reserves for prospective taxes, Clause said.

Offers Color "Stylizer"

The Lowe Brothers Co., Dayton, Ohio, manufacturers of Nepto-Namel, is currently offering its new automotive color stylizer to truck and bus fleet operators and body builders.

By means of transparent masks which are laid over general sized color samples, the "Stylizer" provides an easy and effective way to visualize literally hundreds of different color schemes on the popular types of truck and bus bodies.

Other features of the "Stylizer" include a color harmony chart which "rates" and recommends various color combinations according to their visibility and attention value.

Creates New Department

Indicative of the corporate problems involved in the multiplicity of recent Federal regulations, taxes, etc., Acheson Colloids Corp. has created a new department to handle all problems relating to taxes, priorities, patents, social security, administrative laws, and other questions relating to national defense problems.

The new department will be in direct charge of John C. Sprague, secretary and director of Acheson Colloids Corp.

WORLD'S GREATEST all around ELECTRIC TOOL

**DRILLS—GRINDS—SANDS
SAWS—POLISHES
SHARPENS—CARVES**

ONLY
\$7.95
POSTPAID
GUARANTEED
FOR ONE YEAR



The new **WHIZ ELECTRIC TOOL** is the handiest power tool ever made. A rugged tool for power and precision work. Drills through 1/4 inch iron plate in 42 seconds or engraves intricate designs. Handles any material: Metals—Woods—Alloys—Plastics—Glass—Steel—etc. Saves time. Eliminates labor. Plug into any socket AC or DC, 110 volts. Chuck 1/4 inch capacity. Ball bearing thrust. Powerful, triple-gear motor. **STANDARD MODEL**, with Normal Speed (uses 200 different accessories, instantly interchangeable). **Price only \$7.95.**

The only DRILL-TOOL with a full year's guarantee

FREE Accessory outfit (Value \$2) includes set of drills, mounted 1 1/2 inch grinder, sanding discs, cutting wheels, mounted brush, polishing wheel, carving burr, etc. **FREE** with each tool ordered **NOW.** We pay postage.

10-DAY TRIAL—MONEY BACK GUARANTEE

PARAMOUNT PRODUCTS CO.

Dept. 9-MTA 545 Fifth Ave. New York, N. Y.

GET RID OF ...



IN THOSE USED CARS!

You can remove the sludge that causes poor compression, sticky valves and rings and sluggish performance in a used car by an expensive overhaul job. But this isn't necessary. You can put new life, new pep, new performance into those cars by a simple, inexpensive treatment which removes all harmful sludge without taking off the cylinder head.

MAGNUS

METAFFIN

—a carefully designed chemical compound with the property of penetrating and dispersing sludge deposits, even when tightly bonded to metal. A small amount, added to the oil in the crankcase, does the job.

MAGNUS METAFFIN

is a penetrating and dispersing agent which loosens and dissolves sludge quickly, safely and surely, so that when the crankcase is drained after treatment, all harmful deposits are removed—particularly those that are bonded to metal on rings and valves and in lubricating passages.

Metaffin is harmless to all metals and to gaskets and other internal motor parts.

Ask us to send you a copy of the Automotive Cleaning Handbook. It contains full details, not only on Metaffin for pepping up used cars, but on many other Magnus Materials to cut your costs on reconditioning cars.

MAGNUS CHEMICAL COMPANY

Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants.

36 South Avenue

Garwood, N. J.



MAGNUS CLEANERS

~ HERE'S THE POOCH.
NOW WHY DON'T YOU USE
SOUTHERN
BRAKE LINING

SOUTHERN
FRICTION MATERIALS CO. - CHARLOTTE, N.C.

New Streamlined Design
KNICKS MEND-RITE
Vulcanizing Patches

3-Ply Laminated Rubber TWO UNIVERSAL SIZES

MEETS ALL REQUIREMENTS Des. Pat. Appl. for

7 Big Features for Extra Dependability

- 3-ply laminated rubber
- Produces up to 3400 lbs. tensile strength per square inch for 25% stronger repair
- Material perfected to overcome overcuring and setting up with age
- Experimental tests made—material placed in oven at 119 degrees Fahr. for 6 months with complete success
- Fuse scientifically placed for speed burning of fuel unit
- Each unit wrapped and heat sealed in pofilm; moisture proof
- One-ply strawboard assures uniform burning.

SAMPLES ON REQUEST—Write today for full information for distributorship complete Mend-Rite line.

KNICKSMEND-RITE CO. North Kansas City, Missouri

TOP QUALITY.. LOW PRICE

Wire Joe

Wire and Cable
Pawtucket, R. I.

MECHANICS STUDY

All of the nine mechanics in the service department of Laev Motors, Inc., Milwaukee, voluntarily are continuing their school education, with the approval of R. E. Schlei, service manager, and officials of the company.

Schlei believes that the better educated a mechanic is, especially in business, salesmanship, courtesy, and the better he can use the English language, the more satisfactorily he can serve customers. He bases this conviction on the idea that the well trained serviceman, like the well equipped service department, aids greatly in maintaining constant and profitable contact with the motorist.

All the nine mechanics of the Laev Motors are attending technical and business schools and university extension branches in Milwaukee in their spare time, taking courses of various sorts, including business management, and all show the desire to continue taking additional courses when they have finished their present ones. Schlei himself is a graduate of the University of Wisconsin, and he has sold all his men on the value of such extra courses, both to themselves and to the company.

The added technical and business knowledge of the mechanics, according to Schlei, has helped increase business, has helped to sell more services, and has brought interested comments from many of the customers.

Schlei set an example for his men by taking a business management course at the extension university in merchandising, marketing and sales psychology.

"While the average motorist respects a mechanic's technical knowledge and skill," says Schlei, "he has more respect when he learns that the mechanic speaks properly, knows a lot about business and can converse with him on an equal basis in this regard. This added knowledge, too, makes the mechanic a better and more valuable employee."

Herbert Laev, president of the firm, is heartily in accord with the policy and encourages the men as they show interest in how they are progressing with their courses.

SpeedWay 1/2" No. 89 DRILL

Full size, full weight, full capacity. Specially wound high torque 115 V. Universal 500 R.P.M. SpeedWay motor. Forced air cooling, oilless bearings, natural grip breast plate, removable side handle. Streamlined die cast case.

\$27.50

SPEEDWAY MFG. CO.
1880 S. 52nd Ave. Cicero, Ill.

Handy
RECT-O-LYZR

FAST CHARGER
Accurately tests each cell SEPARATELY and charges fast and SAFELY at automatically tapered rates —without removing battery from car. Price complete, **\$198.00**

BALDOR ELECTRIC CO.
4375 Duncan Ave., ST. LOUIS, MO.

SWIFT ACCESSORY!

Dealers declare RAILWAY EXPRESS speed an accessory to their success. Use and specify this service that speeds up speed on everything you order.

RAILWAY EXPRESS
AGENCY INC.
NATION-WIDE RAIL-AIR SERVICE

Wheel Balancing Machine... \$18.50

Lowest priced on the market. Takes only a few jobs to pay for it. Can be used with any type of automobile wheel.

Write for Literature

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16893 Wyoming Detroit, Mich.

SAFETY INSURANCE for Auto, Bus, Boat and Truck

BUELL
AIR HORNS

Vibrant—Dependable—Custom made to meet a demand. Buell horns increase safety—assure complete satisfaction. Quality horns for every purpose. Sound range up to 10 miles. Send for FREE literature today.

BUELL MANUFACTURING CO.
2973 Cottage Grove Avenue, Chicago, Illinois

Make Big Profits on Small Investment in SHURHIT IGNITION PARTS

Ask your Shurhit jobber or write us for details on General Ignition Assortments of fast-moving parts... Contact Points... Condensers... Rotors... Caps... Coils... Switches, etc.

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PRATT TAPERED ROLLER BEARINGS

The Perfect Replacement



Line for all
makes of

- Passenger Cars
- Trucks
- Buses
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- Farm Machinery

Recognized as the Standard Replacement Bearing by Jobbers and Servicemen everywhere.

ESTABLISHED 1893

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JOLIET, ILL.

KEX TIRE PLUGS

Stem compressed in needle point metal quill for easy insertion.

Dynamic hole stoppers for punctured casings. A few CENTS in time will save DOLLARS and TIRES! More miles from tires is an economic and patriotic necessity. KEX are more miles conveniently carried for instant use. 3 sizes meet all requirements. "Keep them running with KEX."



Automotive Wholesalers Sell KEX.

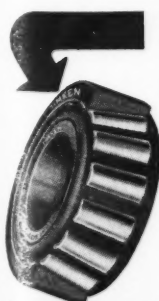
The WEDLER-SHUFORD CO. ST. LOUIS, MO.

YOU'LL NEVER KNOW

● THE PROFIT OPPORTUNITY in Fitzgerald Gaskets until you handle them.

THE FITZGERALD MFG. CO., TORRINGTON, CONN.

FITZGERALD GASKETS



YOUR ASSURANCE
OF CUSTOMER
SATISFACTION
Be Sure You
Get It . . .

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

83 Per Cent of World Cars Made in America

Motor vehicles registered throughout the world as of Jan. 1 this year totaled 45,376,891 units of which 32,452,861 or 71.7 per cent, were in continental United States, according to the Department of Commerce.

A breakdown by types of motor vehicles included in the department's reports records the registration of 36,343,260 passenger cars; 444,028 buses; 8,400,025 trucks; and 189,578 Diesel units.

American makes of motor vehicles, including those produced in Canadian branches of American factories, accounted for about 83 per cent of the total world registrations, it was said.

Countries having the largest number of motor vehicles registered, other than the United States, at the beginning of the year included the United Kingdom, 2,429,580; France, 2,398,500; Canada, 1,477,282; Union of Soviet Socialist Republics, 1,060,000; Australia, 858,905; Italy, 498,500; Union of South Africa, 393,698; Germany, 327,000, and Argentina, 309,500.

The ratio of motor vehicles to population in some of the more densely motorized countries outside of the United States shows New Zealand with 1 motor vehicle to every 6 persons; Canada, 1 to 8; France and Gibraltar, 1 to 17; United Kingdom, 1 to 19; and Denmark, 1 to 23, the report shows.

New Aluminum Plants

The Aluminum Co. of America announces that negotiations have been completed and a contract made with Defense Plant Corp. acting for the United States for the construction and operation of an alumina plant in Arkansas with an annual capacity of 400,000,000 lb., and for the construction and operation of three aluminum smelting plants, one at Massena, N. Y., with an annual capacity of 150,000,000 lb., another in the Portland-Oregon district with an annual capacity of 90,000,000 lb., and a third in Arkansas with an annual capacity of 100,000,000 lb.

Fram Corp. Honored

The Fram Corp., East Providence, R. I., was recently presented with a special citation for Industrial Research in the field of oil and motor cleaners by the Engineering Societies of New England.

This citation was presented for . . . "success in developing, or adapting, through effective research, a product, a process, or a piece of equipment, resulting in higher quality of goods manufactured, or lower costs, or the use of unusual materials, or making feasible new and desirable applications and so extending the possibilities of industrial employment."

for YEARS THOUSANDS of shops have used "KING" TESTERS for TUNE-UP



The
"KING"
K-425

\$213.50
Complete
as shown

SOLD
ON
DEFERRED
PAYMENTS

The reputation that "KING" products enjoy today for accuracy and dependability is the result of years of accumulated effort—years during which our entire organization made every effort to improve "KING" products. The result has been that "KING" has stood the test of time and enjoys the satisfaction that only years of conscientious endeavor can bring. In thousands of shops "KING" products have served faithfully and usefully over a period of many years. Sound engineering and painstaking workmanship are responsible for the success of the "KING" Line.

The "KING" K-425 Unit Tester is a very useful number. With the individual units you can make bench tests, road tests, or use in any part of the shop. The "KING" K-425 Unit Tester has the following five units which may be purchased separately: (1) Ignition and Cam Angle Tester; (2) Generator Voltage-Regulator Tester; (3) All Electric Spark Plug Tester; (4) New oscillator type Condenser Tester; (5) Exhaust Gas Analyzer with vacuum and fuel pump test.

SAVE GAS with a "KING" EXHAUST GAS ANALYZER \$34.00



You can cash in on the vast amount of publicity, about saving gas, that has flooded our newspapers the past few months. Install a "KING" Exhaust Gas Analyzer, and tell your customers that you can get them MORE MILES PER GALLON. It is simple and easy to operate—quick acting and accurate. The meter indicates both air fuel ratios and percentage of fuel loss with three colored sections indicating lean, idling and rich. Now is the time to get started. Gas must be saved for defense.

Ask our Jobber or Write us Jobber's Name

ELECTRIC HEAT CONTROL CO.
9123 INMAN AVE. CLEVELAND, OHIO
"KING" Good Products Since 1914 "KING"

IT PAYS TO SELL

Pierce Governors

● For trucks, taxis, welders, saw rigs, and all power applications to farm and shop equipment. Dependable long life! Guaranteed! Write for full information.

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AUTOMOBILE SALESMEN AND STATION ATTENDANTS!
People always need food, medicines and other Rawleigh necessities. No priority to put you out of business. Sell Rawleigh's well-known Products. Good nearby route open. Write today. Rawleigh's, Dept. I-151-MTG, Freeport, Ill.

FOR SALE

For Sale: 12 Electric Specialty Generators, some new, some used. Primary 110V, 60C. 5 Amp. 1750 RPM S. P. Secondary 12V. 15 Amp. Compound Winding. The Cincinnati Time Recorder Co., Cincinnati, Ohio.

PERMAG Cleaning Compounds

- for garage floors
- for motors
- for trucks
- for radiators
- for heavy work

PERMAG is quick in action, low in cost, highly efficient.
Send for details and prices.

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BUY NO BATTERY CHARGER

Until You Have Invested
The VALLEY
SUPERDUTY CHARGER

● Fully Guaranteed for Two Years—Valley, modernized superduty chargers will give you the utmost in value . . . enable you to cash in on the big profits in battery charging. Valley chargers are easy to operate . . . no moving parts . . . connecting to the lighting circuit. Low in operating cost. Order yours today.
Model SG-12 charges 1 to 12 6 volt batteries—\$28.00.



Valley Electric Corp.
4221 Forest Park Blvd., St. Louis, Mo.



Texas Goodrich Plant To Make Bombs, Shells

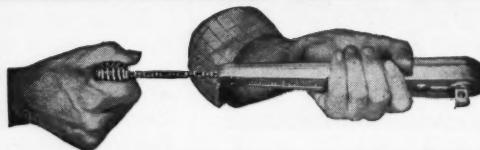
Organization of the Lone Star Defense Corp., a subsidiary of the B. F. Goodrich Co., to engage immediately in the construction and operation of a \$35,000,000 government ordnance plant to be established near Texarkana, Tex., has been announced by John L. Collyer, company president.

Approximately 8000 people will be employed in the construction of the plant, where shells and bombs will be loaded, it was announced. The plant will be located on a tract of more than 24,300 acres seven miles west of Texarkana.

General Electric Earnings in First Half Increase

General Electric Co.'s profit available for dividends for the first six months of this year amounted to \$26,003,665, compared with \$25,981,572 for the same period last year, President Charles E. Wilson has announced. These earnings, which were equivalent in each case to 90 cents a share of common stock, were after provision for Federal income and excess profits taxes of approximately \$52,000,000 for the six months' period this year compared with \$19,000,000 for the same period a year earlier.

SPEED-RATCH



It has
ZIP-ACTION

removes or tightens nuts in a jiffy.

BEALL SPEED-RATCH is the new, improved Ratchet Wrench with patented pull-chain in handle. Quickly and easily tightens or loosens nuts at the hard-to-get-at spots — without finger manipulation. Saves valuable time in Auto Repair work. Satisfaction guaranteed. **ASK YOUR JOBBER** or write us. List Price **\$6.00**

BEALL TOOL COMPANY - - - East Alton, Illinois
Div. of Hubbard & Company

CHAMPION High Rate BATTERY CHARGER 60 AMPERE CAPACITY



\$125.00

F.O.B.
Kansas City, Mo.
FULL JOBBER PROFITS

—the Safe, Fast, Efficient Charging Rate

Small but powerful, with the star features usually found only in expensive machines. Automatically controlled; high rate charge, automatic taper charge and conventional type. Portable; analyzes and tests battery in the car, charging in 5 to 30 minutes. Jobber inquiries invited.

WEIGHT
47½ lbs.

HONEYCUTT MFG. COMPANY, INC.

2715-17 OAK
KANSAS CITY, MO.

A PERMANENT SEAL with . . .



PAX-WELD

A few minutes work and cracked valve ports, cylinders, water jackets and aluminum heads are sealed permanently with PAX-WELD, without taking down the motor. Follow directions for guaranteed results.

See your jobber or write TODAY!

JOHN S. MCKENZIE
Rutherford, New Jersey

RIMAC HEX DIES AND TAPS

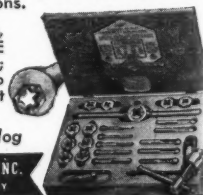
for a Solid Grip!

Rimac HEXSET has all dies 1" Hex outside for firm grip in die-stock, wrench or ratchet. Tap wrench has 3/8" square tap opening to fit ratchet extensions.

SET No. 77—11 taps, 11 dies, 5/16-1/2" SAE and USS; 1/8" pipe; 9" die stock; tap wrench. Dealer net \$9.75

Send for Rimac Catalog

RINCK-McILWAINE, INC.
16 HUDSON ST. NEW YORK, N. Y.



BLUE CROWN
SPARK PLUGS



FINNED SHELL SAVES GAS

Ask your Jobber
MOTOR MASTER PRODUCTS CORP.
4757 Ravenswood Ave., Chicago, U.S.A.
Export Distribution
Borg-Warner International Corp., Chicago

try **SPEAKER** **MATCH PATCHES**


For Better Vulcanized Tube Repairs.
Higher Profit, more satisfied customers.
Hermetically sealed in **MOISTURE-PROOF**
Pliofilm. Instant lighting **WICK FUSE**.
Fit any clamp. Box of 50's—\$1.45.

Send for free sample.

J. W. SPEAKER CORPORATION
Milwaukee, Wisconsin

TRADE MARK
NOC-OUT
HOSE CLAMPS

THE HOSE CLAMP
WITH THE
THUMB SCREW



For fast, dependable hose connections, use **NOC-OUT** Hose Clamps . . . standard in the automotive industry for many years for their leakproof, trouble-free sealing features. Quick tightening thumb screw provides equal pressure all around. Type "A" Adjustable . . . fits many hose sizes. Type **GBB** heavy duty, solid band for **Booster Brakes**. **G8HH** for all heater hose. Type **HP** for all high pressure air and gas lines. Sold by dealers and jobbers everywhere.

WITTEK MFG. CO.
4305 W. 24th PL., CHICAGO, U.S.A.

OUTSTANDING

performance in the
Automotive Industry



Summers First President of Kentucky Dealers

Turner A. Summers, Louisville, assumed his duties, Aug. 18, as president of the Kentucky Automobile Dealers Association following his election at first annual meeting. He had been named temporary president at an earlier meeting. Other officers elected by directors: Vice-President, H. F. Galloway, Bowling Green, Ky.; secretary-treasurer, Paul Dexheimer, Somerset, Ky.

Wins Soap Box Derby

Persistence paid off with rich rewards to one young American boy who now wears the crown as king of Soap Box Derby racing in all the world—14-year-old Claude Smith, Akron, Ohio, who late in August was tasting the sweets of his great victory in the All-American and International Soap Box Derby.

Racing before the largest crowd in the history of this unique event, young Smith succeeded in bringing to the derby's home city its first national and international victory. More than 65,000 excited fans, including a clamorous majority of home-town supporters, filled every seat and vantage point along Akron's Derby Downs.

Yellow Truck Dividend

At a meeting of the directors of the Yellow Truck & Coach Manufacturing Co. today, a quarterly dividend of \$1.75 per share was declared on the company's 7 per cent cumulative preferred stock.

Dividends of 25 cents on the company's common stock and 25 cents on the company's class C stock also were declared.

All three dividends are payable on Oct. 1 on stock of record Sept. 16, 1941.

Creates Defense Posts

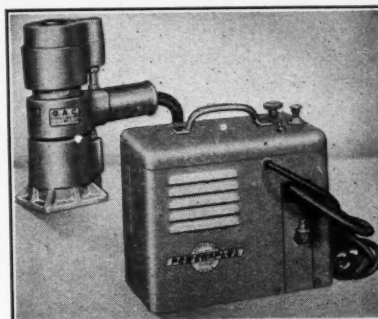
To facilitate cooperation with the national defense program, the Belden Manufacturing Co. has appointed a defense coordinator and a manager of Priorities Division, it has been announced by Whipple Jacobs, president of the company.

E. V. Blake, eastern manager for the firm, has been named defense coordinator. J. V. Van Buskirk, formerly in the sales department, heads the Priorities Division of the company.

Consolidated Moves

Consolidated Wire and Associated Corporations announces that on Sept. 1 all production and general office facilities will be moved to new and larger quarters at 1635 S. Clinton Street, Chicago, Ill. According to J. G. Mann, treasurer, who released the announcement, the move is being made to facilitate the handling of orders for the numerous products of the company.

Can You Afford to be Without Them?



G. A. C. Automatic Two-Speed Twin-Cylinder Power Unit

Two high speed pumps quickly force ram to contact load, then automatically cut out and powerful slower speed pumps lift load. Two cylinders working at all times give continuous uninterrupted flow of power to ram.

Modern Fenders Demand

THE H-289 PERFECTION POWER-PLUS UNIVERSAL FENDER SPREADER

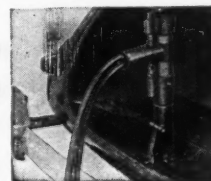


for close work where wide spreading is necessary and for spreading between fender and fender well. Closes to 1 1/4" and opens to 19 3/4" with 6" ram travel. \$14.75. It pays for itself on first six jobs.

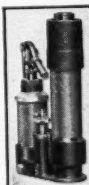
Power In a Small Area

H-80

Perfection Power-Plus Push-Pull Spreader



For use with Perfection Push-Pull Jack. Ideal for trunks, pushing out sills, etc. Fits into 1" space. Open width 5 1/2". \$8.50.



Perfection Power-Plus HYDRAULIC JACK

The only double-acting **PUSH-PULL** hydraulic jack supplies direct pull, for the repair of box channels, rear trunk racks, door posts, etc. Two units handle any type of body aligning, frame work, fender straightening, knee-action adjustment, steel running board straightening.

- Fills 100% with any amount of handle travel.
- Swivel handle allows operation in any position, even upside down.
- Immediately adjustable.
- Safety valve prevents overloading, bending or breaking.

Order from your jobber or write for catalog
G. A. C. MFG. CO., Ashland, Ohio

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This Advertisers' Index is published as a convenience, and not as part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

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